

The LADIES' *Diary*;

OR

756. 6 11

WOMAN'S ALMANACK,

For the Year of our LORD 1781;

Being the First after BISSEXTILE, or LEAP-YEAR

Containing New Improvements in ARTS and SCIENCES,

And many Entertaining PARTICULARS:

Designed for the *Use* and *Diverſion* of the

FAIR-SEX. *17.2465*
2

The Seventy-eighth ALMANACK Published of this Kind.



VIRTUE and SENSE, with FEMALE-SOFTNESS join'd,
(ALL that subdues and captivates Mankind!)

In BRITAIN'S Matchless FAIR resplendent shine;

THEY rule LOVE's Empire by a Right Divine:

Justly their Charms the astonish'd World admires,

Whom *Royal* CHARLOTTE's bright Example fires.

Printed for the COMPANY of STATIONERS,

and sold by JOHN WILKIE, at their Hall in Ludgate-Street.

[Price, stitched, NINE-PENCE.]

<i>Y. of Christ.</i>	<i>Ys. since.</i>	<i>Y. of Christ.</i>	<i>Ys. since.</i>		
1600	King Charles I. born -	181	1713	Peace with France procl. -	68
1603	Q. Eliz. died, K. Ja. succ.	178	1714	Q. Ann died, K. Geo. I. succ.	67
1603	A great Plague in London	178	1715	Rebellion in the north -	66
1605	Popish Gun-powder Plot -	176	1716	A very great frost -	65
1616	Shakspeare the poet died	165	1726	Sir Isaac Newton died -	55
1625	K. James died, Cha. I. succ.	156	1727	K. Geo. I. died, Geo. II. succ.	54
1641	Bloody Irish massacre -	140	1739	War against Spain declared	42
1642	Sir I. Newton born, Dec. 25	139	1739	A very great frost -	42
1649	K. Charles I. beheaded -	132	1743	A great comet appeared -	38
1658	Oliver Cromwell died -	123	1744	War against France declared	37
1660	K. Charles II. restored -	121	1745	Rebellion in Scotland -	37
1662	Royal Society instituted	119	1748	A general peace -	33
1665	Died of the plague 68,586	116	1750	Westminster bridge finished	31
1666	Great fire in London -	115	1752	Date and Calendar altered	29
1666	War against Denmark decl.	115	1756	War against France declared	25
1667	Peace with Hol. Fr. & Denm.	114	1760	K. Geo. II. died, G. III. succ.	23
1672	War against Holland decl.	109	1762	American philos. soc. instit.	19
1672	Halfpence & Farth. coined	109	1762	War against Spain declared	19
1674	Peace with Holland procl.	107	1763	Peace with France & Spain	18
1679	Habeas Corpus act passed	102	1765	Otaheite discovered -	18
1685	K. Cha. II. died, Ja. II. succ.	96	1770	Blackfriars bridge finished	18
1688	Prince of Orange landed -	93	1772	A revolution in Denmark -	18
1688	K. James II. abdicated -	93	1772	A revolution in Sweden -	18
1689	Wm. and Mary crowned	92	1775	War against America begun	18
1693	Hackney coaches established	88	1776	America declared independent	18
1702	K. Wm. died, Q. Ann succ.	79	1778	French treaty with America	18
1702	War against France declared	79	1778	War against Fr. commenced	18
1707	England & Scotland united	74	1779	War against Spain begun -	18

BIRTH-DAYS, [N.S.] and YEARS, of the ROYAL FAMILY
of GREAT BRITAIN.

KING GEORGE III. June 4, 1738	Prince Adolph. Fred. Feb. 24, 1744
Prince of Wales, August 12, - 1762	Princess Mary, April 25, - 1771
Prince Frederick, August 16, 1763	Princess Sophia, Nov. 3, - 1777
Prince William Henry, Aug. 21, 1765	Prince Octavius, Feb. 23, - 1779
Prs. Charl. Aug. Mat. Sept. 29, 1766	Prince Alfred, Sept. 22, - 1780
Prince Edward, Nov. 2, - 1767	Queen Charlotte, May 19, - 1744
Prs. Augusta Sophia, Nov. 8, - 1768	Prs. Amelia, June 10, - 1773
Prs. Elizabeth, May 22, - 1770	Prs. Augusta of Brunsw. Aug. 11, 1771
Prince Ernest Augustus, June 5, 1771	Duke of Gloucester, Nov. 25, 1740
Prince Aug. Fred. Jan. 27, - 1773	Duke of Cumberland, Nov. 7, 1742

YEARS of BIRTHS of the Principal SOVEREIGNS
PRINCES of EUROPE.

Cha. Frederick, King of Prussia, 1712	Stanislaus Aug. King of Poland 1704
Achmet, Grand Signor - - 1715	Maria, Queen of Portugal - 1717
Charles, King of Spain, - - 1716	Joseph Ben. Aug. Emp. Germ. 1745
Maria Theresa, Q. Hung & Boh. 1717	Gustavus, King of Sweden, - 1746
Pius VI. Pope - - - 1717	William V. Stadtholder, - - 1747
Victor Amadea Maria, K. Sardinia 1726	Christian VII. K. of Denmark, 1746
Catherine, Empress of Russia, 1729	Lewis XVI. King of France, - 1775

First Quarter, 2d, 14 m. past 8 night.
Full Moon, 10th, 4 m. past 9 morn.
Last Quarter, 17th, 53 m. past 1 morn.
New Moon, 24th, 11 m. past noon.

Sun enters α
19 d. 2h. 10m.

1	M	Circumcision	8	43	56	22	58	11 a	13	7
2	Tu			4	56		53	Morn.		8
3	W			3	57		46	0	21	9
4	Th			2	58		40	1	33	10
5	F	Old Christmas Day		2	58		33	2	46	11
6	S	Epiphany: Twelfth-Day		1	59		26	4	1	12
7	G	1 Sunday after Epiphany		0	4	0	18	5	18	13
8	M	Lucian: Plow Monday	7	59	1		10	6	31	14
9	Tu			58	2		1	7	36	15
10	W			57	3	21	52	(rises		F
11	Th			56	4		43	5 a	20	17
12	F	Old New-Year's Day		55	5		33	6	48	18
13	S	Hilary. Cam. T. begins		54	6		22	8	15	19
14	G	2 Sunday after Epiphany		52	8		11	9	42	20
15	M	Orf. Term begins		51	9		0	11	7	21
16	Tu			50	10	20	49	Morn.		22
17	W	Old Twelfth-Day		49	11		37	0	32	23
18	Th	Q. Ch. Birth-d. kept. Prisca		47	13		24	1	57	24
19	F			46	14		12	3	21	25
20	S	Fabian. Hil. T. 1 Ret.		45	15	19	59	4	41	26
21	G	3 Sund. aft. Epiph. Agnes		43	17		45	5	56	27
22	M	Vincent		42	18		31	6	56	28
23	Tu	Hilary Term begins		40	20		17	7	44	29
24	W			39	21		3	(sets		N
25	Th	Conversion of St. Paul		37	23	18	48	5 a	14	1
26	F	[2 Ret.		36	24		32	6	28	2
27	S	Pr. Aug. Fred. b. 1773. Hil.		34	26		17	7	41	3
28	G	Sunday after Epiphany		33	27		1	8	51	4
29	M			31	29	17	45	9	58	5
30	T	K. Cha. I. behead. 1649		29	31		28	11	8	6
31	W			28	32		11	Morn.		7

L. of D.	Day Inc.	D. breaks	Tw. ends	Sun East	Cl. bef. S.	7 Stars So.
7 52	0 8	5 59	6 1	4 41	4 23	8 a 42
58	14	57	3	43	6 39	20
8 8	24	53	7	46	8 42	7 58
20	36	49	11	50	10 29	37
34	50	44	16	54	12 0	16
48	1 4	38	22	58	13 11	6 55

First Quarter, 1st, 56 m. past 4 aftern.
 Full Moon 8th, 28 m. past 8 night
 Last Quarter, 15th, 48 m. past 11 morn. 17 d. 17 h. 1 m.
 New Moon, 23d, 55 m. past 5 morn.

MD	MD	Sundays, Holydays, &c.	Sun rises	Sun sets	Sun's Decl.	☾ rises & sets	☾ Ag
1	Th		7 26	4 34	16 54	om 19	8
2	F	Purif. or Candlemas-day	24	36	37	1 31	9
3	S	Blase. Hil. Term, 3 Ret.	23	37	19	2 46	10
4	G	5 Sunday after Epiphany	21	39	1	4 1	11
5	M	Agatha	19	41	15 43	5 9	12
6	Tu		17	43	24	6 8	13
7	W		15	45	5	6 59	14
8	Th		14	46	14 46	☾ rises	15
9	F	Hilary Term, 4 Return	12	48	27	5 a 43	16
10	S		10	50	7	7 13	17
11	G	Septuagesima Sunday	8	52	13 47	8 42	18
12	M	Hilary Term ends	6	54	27	10 11	19
13	Tu	Old Candlemas Day	4	56	7	11 37	20
14	W	Valentine	3	57	12 47	Morn.	21
15	Th		1	59	26	1 4	22
16	F		6 59	5 1	5	2 29	23
17	S		57	3	11 44	3 45	24
18	G	Sextagesima Sunday	57	5	23	4 49	25
19	M		53	7	2	5 41	26
20	Tu		51	9	10 40	6 20	27
21	W		49	11	18	6 44	28
22	Th		47	13	9 56	7 5	29
23	F	Pr. Oslaviu. born 1779	45	15	34	☾ sets	30
24	S	St. Matthias. Pr. Ad. Fr. b.	43	17	12	6 a 37	31
25	G	Quinquag. Sunday [1774	41	19	8 50	7 48	32
26	M		39	21	27	8 58	33
27	Tu	Shrove-Tuesday	38	22	5	10 8	34
28	W	Ash-Wednesday	36	24	7 42	11 21	35

Days	L. of D.	Day Inc	D. breaks	Tw. ends	Sun East	Cl. bef. S.	7 Stars S.
1	9 8	1 24	5 30	6 30	5 4	14 10	6 a 31
6	26	42	22	38	9	36	10
11	44	2 0	14	46	15	41	5 50
16	10 2	18	6	55	21	27	31
21	22	38	4 57	7 4	27	13 56	11
26	42	58	48	13	33	10	4 51

First Quarter, 3d, 35 m. past 10 morn.

Full Moon, 10th, 32 m. past 6 morn.

Last Quarter, 16th, 26 m. past 11 night

New Moon, 24th, 7 m. past midnight

Sun enters ♈
19 d. 17 h. 29 m.

1	Th	David	6	34	5	26	7	f	19	Morn.	6		
2	F	Chad		32		28	6		56	0	34	7	
3	S			30		30			33	1	47	8	
4	G	S. in Lent. Quadrag.		28		32			10	2	57	9	
5	M			26		34	5		47	4	0	10	
6	Tu			24		36			24	4	52	11	
7	W	Ember Week. Perpetua		22		38			0	5	32	12	
8	Th			20		40	4		37	6	1	13	
9	F			18		42			14	6	19	14	
10	S			16		44	3		50	0	rises	F	
11	G	2 Sunday in Lent		14		46			27	7	a	45	16
12	M	Gregory		12		48			3	9	10	17	17
13	Tu			10		50	2		39	10	47	18	18
14	W			8		52			16	Morn.	19		19
15	Th			6		54	1		52	0	17	20	20
16	F			4		56			28	1	40	21	21
17	S	St. Patrick.		2		58			5	2	49	22	22
18	G	3 Sunday in Lent. Edw.		0	6	0	0		41	3	46	23	23
19	M	[K. W. S.]	5	58		2			17	4	28	24	24
20	Tu			56		4	0	n	6	4	59	25	25
21	W	Benedict		54		6			30	5	19	26	26
22	Th			52		8			54	5	33	27	27
23	F			50		10	1		17	5	45	28	28
24	S			48		12			41	6	fets	N	
25	G	4 or Midl.S. Annunc. or		46		14	2		5	6	a	53	1
26	M	[Lady-Day]		44		16			28	8	5	2	2
27	Tu			42		18			52	9	15	3	3
28	W			40		20	3		15	10	28	4	4
29	Th			38		22			38	11	43	5	5
30	F			36		24	4		2	Morn.	6		6
31	S			34		26			25	0	56	7	7

stars	Days	L. of D.	Day Inc.	D. breaks	Tw. ends	Sun East	Cl. S. S.	7 Stars So.
a 31	1	10 52	3 8	4 43	7 18	5 37	12 35	4 a 42
10	6	11 12	28	32	29	43	11 27	24
50	11	32	48	21	40	49	10 8	6
31	16	52	4 8	11	50	55	8 43	3 47
13	21	12 12	28	0	8 1	6 2	7 12	29
51	26	32	48	3 48	12	8	5 39	11

First Quarter, 1st, 56 m. past 4 aftern.
 Full Moon 8th, 28 m. past 8 night
 Last Quarter, 15th, 48 m. past 11 morn.
 New Moon, 23d, 55 m. past 5 morn.

Sun enters ♈
 17 d. 17 h. 1 m.

MD	WD	Sundays, Holydays, &c.	Sun rises	Sun sets	Sun's Decl.	(rises & sets	(Ag
1	Th		7 26	4 34	16 54	om 19	8
2	F	Purif. or Candlemas-day	24	36	37	1 31	9
3	S	Blase. Hil. Term, 3 Ret.	23	37	19	2 46	10
4	G	5 Sunday after Epiphany	21	39	1	4 1	11
5	M	Agatha	19	41	15 43	5 9	12
6	Tu		17	43	24	6 8	13
7	W		15	45	5	6 59	14
8	Th		14	46	14 46	(rises	15
9	F	Hilary Term, 4 Return	12	48	27	5 a 43	16
10	S		10	50	7	7 13	17
11	G	Septuagesima Sunday	8	52	13 47	8 42	18
12	M	Hilary Term ends	6	54	27	10 11	19
13	Tu	Old Candlemas Day	4	56	7	11 37	20
14	W	Valentine	3	57	12 47	Morn.	21
15	Th		1	59	26	1 4	22
16	F		6 59	5 1	5	2 29	23
17	S		57	3 11	44	3 45	24
18	G	Sexagesima Sunday	57	5	23	4 49	25
19	M		53	7	2	5 41	26
20	Tu		51	9 10	40	6 20	27
21	W		49	11	18	6 44	28
22	Th		47	13	9 56	7 5	29
23	F	Pr. Octaviu. born 1779	45	15	34	(fets	30
24	S	St. Matthias. Pr. Ad. Fr. b.	43	17	12	6 a 37	31
25	G	Quinquag. Sunday [1774	41	19	8 50	7 48	32
26	M		39	21	27	8 58	33
27	Tu	Shrove-Tuesday	38	22	5 10	8	34
28	W	Ash-Wednesday	36	24	7 42	11 21	35

Days	L. of D.	Day Inc	D. breaks	Tw. ends	Sun East	Cl. bef. S.	7 Stars S.
1	9	8	1 24	5 30	6 30	5 4	14 10
6		26	42	22	38	9	36
11		44	2 0	14	46	15	41
16	10	2	18	6	55	21	27
21		22	38	4 57	7 4	27	13 56
26		42	58	48	13	33	10

First Quarter, 3d, 35 m. past 10 morn.

Full Moon, 10th, 32 m. past 6 morn.

Last Quarter, 16th, 26 m. past 11 night

New Moon, 24th, 7 m. past midnight

Sun enters γ
19 d. 17 h. 29 m.

1	Th	David	16	34	5	26	7	f	19	Morn.	6
2	F	Chad		32		28	6	56	0	34	7
3	S			30		30		33	1	47	8
4	G	S. in Lent. Quadrag.		28		32		10	2	57	9
5	M			26		34	5	47	4	0	10
6	Tu			24		36		24	4	52	11
7	W	Ember Week. Perpetua		22		38		0	5	32	12
8	Th			20		40	4	37	6	1	13
9	F			18		42		14	6	19	14
10	S			16		44	3	50	(rises	F	
11	G	2 Sunday in Lent		14		46		27	7 a	45	16
12	M	Gregory		12		48		3	9	10	17
13	Tu			10		50	2	39	10	47	18
14	W			8		52		16	Morn.	19	
15	Th			6		54	1	52	0	17	20
16	F			4		56		28	1	40	21
17	S	St. Patrick.		2		58		5	2	49	22
18	G	3 Sunday in Lent. Edw.		0	6	0	0	41	3	46	23
19	M	[K. W. S.	5	58		2		17	4	28	24
20	Tu			56		4	on	6	4	59	25
21	W	Benedict		54		6		30	5	19	26
22	Th			52		8		54	5	33	27
23	F			50		10	1	17	5	45	28
24	S			48		12		41	(sets	N	
25	G	4 or Midl. S. Annunc. or		46		14	2	5	6 a	53	1
26	M	[Lady-Day		44		16		28	8	5	2
27	Tu			42		18		52	9	15	3
28	W			40		20	3	15	10	28	4
29	Th			38		22		38	11	43	5
30	F			36		24	4	2	Morn.	6	
31	S			34		26		25	0	56	7

Days	L. of D.	Day Inc.	D. breaks	Tw. ends	Sun East	Cl. Bar. S.	7 Stars So.
1	10 52	3 8	4 43	7 18	5 37	12 35	4 a 42
6	11 12	28	32	29	43	11 27	24
11	32	48	21	40	49	10 8	6
16	52	4 8	11	50	55	8 43	3 47
21	12 12	28	0	8 1	6 2	7 12	29
26	32	48	3 48	12	8	5 39	11

First Quarter, 1st, 3 m. past 12 night
 Full Moon, 8th, 41 m. past 3 aftern. Sun enters 8
 Last Quarter, 15th, 16 m. past 1 aftern. 19 d. 6 h. 17 m
 New Moon, 23^d, 21 m. past 5 aftern.

1	G	5 Sunday in Lent	5	32	6	28	4	n 48	1	m 59
2	M			30		30	5	11	2	54
3	Tu	<i>Richard</i>		28		32		34	3	38
4	W	<i>St. Ambrose</i>		26		34		57	4	10
5	Th	Old Lady-Day		24		36	6	19	4	34
6	F	Lamb. Term ends		22		38		42	4	52
7	S	Off. Term ends		20		40	7	5	5	7
8	G	6 S. in Lent, Palm-Sund.		18		42		27	(rises	
9	M			17		43		49	8 a 21	
10	Tu			15		45	8	11	9	55
11	W			13		47		33	11	26
12	Th			11		49		55	Morn.	
13	F	Good-Friday		9		51	9	17	0	44
14	S			7		53		38	1	48
15	G	Easter-Day		5		55	10	0	2	37
16	M	Easter-Monday		3		57		21	3	12
17	Tu	Easter-Tuesday		1		59		42	3	34
18	W		4	59	7	1	11	3	3	52
19	Th	<i>Alphege</i>		57		3		24	4	5
20	F			56		4		44	4	15
21	S			54		6	12	5	4	26
22	G	1 S. aft. East. Low-Sund.		52		8		25	4	36
23	M	St. George		50		10		45	(sets	
24	Tu			48		12	13	4	8 a 24	
25	W	St. Mark. Prs. Mary bo.		46		14		24	9	39
26	Th	[Off. & Cam. T. b.]		45		15		43	10	53
27	F			43		17	14	2	11	58
28	S			41		19		21	Morn.	
29	G	2 Sunday after Easter		39		21		40	0	56
30	M	Easter Term, 1 Return		37		23		58	1	44

Days	L. of D.	Day Inc.	D. breaks	T w. ends	Sun East	Cl. bet S.	7 Stars
1	12 56	5 12	3 33	8 28	6 15	3' 48"	2 a 4
6	13 16		32 20	41	21	2 18	
11	34		50 6	55	27	0 53	
16	54	6 10	2 54	9 7	33	0 a 24	1
21	14 12		28 40	21	39	1 31	
26	30		46 23	38	45	2 27	

First Quarter, 1st, 27 m. past 9 morn.
 Full Moon, 7th, 18 m. past 12 night.
 Last Quarter, 15th, 22 m. past 4 morn.
 New Moon, 23d, 21 m. past 8 morn.
 First Quarter, 30th, 47 m. past 3 aftern.

Sun enters II
 21d. 6h. 55 m.

1	Tu	St. Phil. & St. James	4	36	7	24	15	16	2	19	8
2	W	Easter Term begins		34		26		34	2	44	9
3	Th	Invention of the Cross		32		28		52	3	3	10
4	F			31		29	16	9	3	19	11
5	S			29		31		26	3	33	12
6	G	3 S. aft. East. John A. P. L.		27		33		43	3	47	13
7	M	Easter Term, 2 Return		25		35	17	0	Q rises		F
8	Tu			24		36		16	8 a	56	15
9	W			22		38		32	10	23	16
10	Th			21		39		47	11	35	17
11	F			19		41	18	3	Morn.		18
12	S	Old May Day		18		42		18	0	33	19
13	G	4 Sunday after Easter		16		44		33	1	15	20
14	M	Easter Term, 3 Return		14		46		47	1	42	21
15	Tu			13		47	19	1	2	1	22
16	W			12		48		15	2	15	23
17	Th			10		50		29	2	27	24
18	F			9		51		42	2	36	25
19	S	Q. Charl. b. 1744 Dunstan		7		53		55	2	46	26
20	G	5 S. aft. East. Rog. Sund.		6		54	20	7	2	56	27
21	M	Easter Term, 4 Return		5		55		19	3	10	28
22	Tu	Prs. Eliz. bo. 1770		3		57		31	3	25	29
23	W			2		58		42	Q sets		N
24	Th	Ascension. Holy Thurs.		1		59		54	9 a	50	1
25	F	Easter Term, 5 Return		0	8	0	21	4	10	52	2
26	S	Augustine, A. B.	3	58		2		15	11	43	3
27	G	S. after Ascens. Ven. Bede		57		3		25	Morn.		4
28	M	Easter Term ends		56		4		34	0	22	5
29	Tu	K. Charles II. Rest. 1660		55		5		44	0	50	6
30	W			54		6		53	1	10	7
31	Th	Off. Term ends		53		7	22	1	1	27	8

Days	L. of D.	Day Inc.	D. breaks	Tw. ends	Sun East	Cl. aft. S.	7 Stars So.
1	14 48	7 4	2 4	9 58	6 50	3' 11"	0 a 57
6	15 6	22	1 50	10 12	55	42	38
11	22	38	28	34	7 0	58	19
16	36	54	4	59	4	0	11 m 59
21	50	8 8	0 24	11 41	8	3 48	40
26	16 4	22	No Night.		12	21	20

Full Moon, 6th, 53 m. past 8 morn.
 Last Quarter, 13th, 5 m. past 9 even.
 New Moon, 21st, 34 m. past 8 even.
 First Quarter, 28th, 28 m. past 8 even.

Sun enters ☿
 zod. 15 h. 40 m.

1	F	Nicomede	3	52	8	8	22	n	9	1	m	40	9
2	S			51		9			17	1	53	10	
3	G	Whit. Sunday		51		9			24	2	6	11	
4	M	K.G.III.b.1738. Whit-M.		50		10			31	2	22	12	
5	Tu	Pr. Er. Aug. b. 1771. Whit-		49		11			38	2	44	13	
6	W	Emb. Week. [Tues. Bonif.		48		12			44		rises	F	
7	Th			48		12			50	10	a	16	
8	F			47		13			55	11	6	16	
9	S			46		14	23		0	11	41	17	
10	G	Trin. S. Prs. Am. b. 1711.		46		14			5		Morn.	18	
11	M	St. Barnabas Trin. Ter.		45		15			9	0	1	19	
12	Tu	[1 Ret.		45		15			13	0	17	20	
13	W	Orf. Term begins		44		16			16	0	30	21	
14	Th	Corpus Christi		44		16			19	0	40	22	
15	F	Trinity Term begins		44		16			22	0	51	23	
16	S			43		17			24	1	c	24	
17	G	1 Sun. aft. Trin. St. Alban		43		17			25	1	9	25	
18	M	Trinity Term, 2 Return							27	1	26	26	
19	Tu		Longest Day, at Lond. is 16 h. 34 m. 4 sec. allowing 9 m. 16 sec. for refraction.						28	1	44	27	
20	W	Transf. Edw. K.W.S.							28	2	9	28	
21	Th	Longest Day							28		rises	N	
22	F								28	9	a	33	
23	S								27	10	17	2	
24	G	2 S. aft. Tr. St. John Bapt.							26	10	47	3	
25	M	Trinity Term, 3 Return			43		17			24	11	10	4
26	Tu				44		16			22	11	27	5
27	W				44		16			20	11	40	6
28	Th				44		16			17	11	54	7
29	F	St. Peter		45		15			14		Morn.	8	
30	S			45		15			10	0	7	9	

Days	L. of D.	Day Inc.	D. breaks Tw. ends	Sun East	Cl. aft. S.	7 Stars So.
1	10 16	8 34	No night, but constant day or twilight.	7 16	2 35"	10 m 55
6	24	52		18	1 45	35
11	30	9 8		19	0 49	15
16	34	22		20	0 b 14	9 56
21	34	22		21	1 19	33
26	32	0 dec. 2		20	2 23	13

Full Moon, 5th, 18 m. past 6 even.
 Last Quarter, 13th, 25 m. past 2 aftern.
 New Moon, 21st, 33 m. past 6 morn.
 First Quarter, 28th, 5 m. past 1 morn.

Sun enters Ω
 22 d. 2 h. 30 m.

9	G	3 Sunday after Trinity	3	46	8	14	23	n	6	om	22	10
10	M	Visitat. V.M. Tr.T. 4 Ret.	4	0		14		2	0	43		11
11	Tu	Dog-days beg Ce. Com.	4	7		13	22	57	1	6		12
12	W	Trin.T. ends. Transf. St.	4	7		13		52	1	44		13
13	Th	Old Midf. Day. [Mart.	4	8		12		46	(rises		F
14	F	Camb. Term ends	4	9		11		40	9	a	33	15
15	S	Oxford A&T. Th. a Becket	4	9		11		34	9	58		16
16	G	4 Sunday after Trinity	5	0		10		27	10	17		17
17	M		5	1		9		19	10	32		18
18	Tu		5	2		8		12	10	42		19
19	W		5	3		7		4	10	52		20
20	Th		5	4		6	21	56	11	2		21
21	F		5	5		5		47	11	12		22
22	S	Orf. Term ends	5	6		4		38	11	26		23
23	G	5 S. aft. Trin. Swithin	5	7		3		28	11	42		24
24	M		5	8		2		18	Morn.			25
25	Tu		5	9		1		8	0	5		26
26	W		4	0		0	20	58	0	36		27
27	Th		2	7		58		47	1	22		28
28	F	Margaret	3			57		35	2	21		29
29	S		4			56		24	(sets		N
30	G	6 S. aft. Trin. M. Magd.	5			55		12	9	a	9	1
31	M		7			53		0	9	29		2
	Tu		8			52	19	47	9	45		3
	W	St. James	10			50		34	9	57		4
	Th	St. Anne, Mother of V.M.	11			49		21	10	11		5
	F		12			48		7	10	24		6
	S		14			46	18	53	10	42		7
	G	7 Sunday after Trinity	15			45		39	11	5		8
	M		17			43		24	11	38		9
	Tu		18			42		10	Morn.			10

cars So.	h	L. of D.	Day dec.	D breaks	Tw. ends	Sun East	Cl. bef. S.	7 Stars So.	
m 55	6	28	0 6			7 19	3 23 ⁰⁰	8 m 52	
35	6	22	12			18	4 17	32	
15	6	14	20			15	5 1	11	
56	6	4	30	No real Night.			12	34	7 51
33	15	52	42			9	56	31	
13	6	38	56	0 52	11 4	5	6 3	11	

Full Moon, 4th, 31 m. past 5 morn.
 Last Quarter, 12th, 47 m. past 7 morn.
 New Moon, 19th, 20 m. past 3 aftern.
 First Quarter, 26th, 3 m. past 7 morn.

Sun enters ♍
 22 d. 8 h. 50 m.

1	W	Lammas.	4	20	7	40	17	n	54	0	m	26	11
2	Th			22		38		39	1		26	12	
3	F			23		37		23	2		38	13	
4	S			25		35		7	7	↑	rises	13	
5	G	8 Sunday after Trinity		26		34	16	51	8	a	35	14	
6	M	Transfiguration		28		32		34	8		47	16	
7	Tu	Name of Jesus		30		30		18	8		57	17	
8	W			31		29		1	9		9	18	
9	Th			33		27	15	43	9		18	19	
10	F	St. Lawrence		35		25		26	9		31	20	
11	S	Prs. Bruns. bo. 1737. Dec. Ds. end		37		23		8	9		46	21	
12	G	9 S. af. Tr. Pr. Wa. b. 1762		38		22	14	50	10		6	22	
13	M	[Old Lam.-Day		40		20		31	10		32	23	
14	Tu			42		18		13	11		13	24	
15	W			44		16	13	54			Morn	25	
16	Th	Pr. Fred. born 1763		45		15		35	0		5	26	
17	F			47		13		16	1		12	27	
18	S			49		11	12	56	2		31	28	
19	G	10 Sunday after Trinity		51		9		37	7	↑	sets	29	
20	M			53		7		17	7	a	50	30	
21	Tu	Pr. Wm. Henry bo. 1765		54		6	11	57	8		7	31	
22	W			56		4		37	8		21	32	
23	Th			58		2		16	8		35	33	
24	F	St. Bartholomew	5	c		c	10	56	8		52	34	
25	S			2	6	58		35	9		13	35	
26	G	11 Sunday after Trinity		4		56		14	9		42	36	
27	M			6		54	9	53	10		26	37	
28	Tu	St. Augustine		8		52		32	11		24	38	
29	W	Behead. J. Bapt.		9		51		10			Morn.	39	
30	Th			11		49	8	49	0		30	40	
31	F			13		47		27	1		46	41	

ay.	L. of D.	Day dec.	D. breaks	Tw. ends	Sun East	Cl. bef. S.	7 Stars
1	15 20	1 14	1 24	10 34	7 0	5' 51"	6 m 4
6	4	30	44	14	6 55	24	
11	14 46	48	2 2	9 56	50	4 43	
16	30	2 4	20	39	44	3 49	5
21	12	22	35	24	39	2 42	
26	13 52	42	50	9	33	1 23	

Full Moon, 2d, 25 m. past 7 even.
 Last Quarter, 10th, 11 m. past 12 night
 New Moon, 17th, 58 m. past 11 night
 First Quarter, 24th, 34 m. past 3 aftern.

Sun enters ♈
 22d. 5 h. 14 m.

1	S	Giles	5	15	6	45	8	n	5	3	m	5	13
2	G	12 Saft. Tr. Lond. burnt,		17		43	7	43		Q	rises		F
3	M	[1666]		19		41		21		7	a	13	15
4	Tu			21		39	6	59		7	24		16
5	W			23		37		37		7	33		17
6	Th			25		35		14		7	44		18
7	F	Enurchus		27		33	5	52		7	58		19
8	S	Nativity of V. Mary		29		31		29		8	14		20
9	G	13 Sunday after Trinity		31		29		6		8	38		21
10	M			32		28	4	44		9	12		22
11	Tu			34		26		21		9	59		23
12	W			36		24	3	58	10	58			24
13	Th			38		22		35		Morn.			25
14	F	Holy-Cross		40		20		12		0	10		26
15	S			42		18	2	49		1	35		27
16	G	14 Sunday after Trinity		44		16		25		3	5		28
17	M	Lambert		46		14		2		Q	sets		N
18	Tu			48		12	1	39		6	a	34	1
19	W	Ember Week		50		10		15		6	48		2
20	Th			52		8	0	52		7	4		3
21	F	St. Matthew [bo. 1780]		54		6		29		7	23		4
22	S	K. Geo. III. cor. Pr. Alfred		56		4		5		7	50		5
23	G	15 Sunday after Trinity		58		2	0	18		8	32		6
24	M		6	0		0		42		9	26		7
25	Tu			2	5	58	1	5	10	31			8
26	W	St. Cyprian		4		56		29	11	44			9
27	Th			6		54		52		Morn.			10
28	F	[Mat. bo. 1766.]		8		52	2	16		1	3		11
29	S	St. Michael. Prs. Ch. Aug.		10		50		39		2	20		12
30	G	16 S. aft. Trin. St. Jerome		12		48	3	2		3	37		13

Days	L. of D.	Day dec.	D. breaks	T.w. ends	Sun East	Cl. aft. S.	Stars So.
1	13 30	3 4	3 7	8 52	6 26	0 24"	4 m 51
6	10	24	21	38	20	2 2	33
11	12 52	42	34	25	14	3 44	15
16	32	4 2	45	14	8	5 23	3 57
21	12	22	56	3	2	7 12	40
26	11 52	42	4 7	7 52	5 55	8 54	20

Full Moon,	2d,	2 m. past	12 noon	Sun enters m
Last Quarter,	10th,	50 m. past	2 aftern.	22 d. 13 h. 5 m.
New Moon,	17th,	9 m. past	9 morn.	
First Quarter,	24th,	35 m. past	3 morn.	

1	M	Remigius	6	14	5	46	3	f	26	4	m	49	14
2	Tu			16		44			49			(rises	P
3	W			18		42	4	12		6	a	2	16
4	Th			20		40			35	6		15	17
5	F			22		38			59	6		30	18
6	S	Faith		24		36	5	22		6		50	19
7	G	17 Sunday after Trinity		26		34			45	7		19	20
8	M			28		32	6	8		8		0	21
9	Tu	St. Denys		29		31			30	8		53	22
10	W	Old Mic. Day. Orf. and		31		29			53	9		57	23
11	Th	[Cam. T. begin		33		27	7	16		11		14	24
12	F			35		25			39			Morn.	25
13	S	Tr. of K. Edw. Confessor		37		23	8	1	0	40			26
14	G	18 Sunday after Trinity		39		21			23	2		8	27
15	M			41		19			46	3		37	28
16	Tu			43		17	9	8		5		7	29
17	W	Etheldred		45		15			30			(sets	N
18	Th	St. Luke		47		13			52	5	a	33	1
19	F			49		11	10		13	5		57	2
20	S			51		9			35	6		31	3
21	G	19 Sunday after Trinity		53		7			56	7		19	4
22	M			55		5	11		18	8		25	5
23	Tu			56		4			39	9		37	6
24	W			58		2	12		0	10		56	7
25	Th	K. Geo. III. Acc. Crispin	7	0		0			20			Morn.	8
26	F	K. Geo. III. Procl. 1760		2	4	58			41	0		14	9
27	S			4		56	13		1	1		30	10
28	G	20 S. aft. Trin. St. Sim.		6		54			21	2		43	11
29	M	[and St. Jude		8		52			41	3		54	12
30	Tu			9		51	14		1	5		4	13
31	W			11		49			20	6		15	14

Days	L. of D.	Day dec.	D. breaks	Tw. ends	Sun East	Cl. aft. S.	7 Stars
1	11	32	5 2	4 18	7 41	5 49	10' 32"
6		12	22	29	30	43	12 2
11	10	54	40	39	20	37	13 22
16		34	6 0	49	10	31	14 28
21		14	20	59	0	25	15 20
26	9	56	38	5 8	6 51	19	56

N^o 78 November hath XXX Days. 13

Full Moon, 1st, 29 m. past 6 morn.
 Last Quarter, 9th, 21 m. past 3 morn.
 New Moon, 15th, 12 m. past 7 even.
 First Quarter, 22d, 32 m. past 7 even.
 Full Moon, 30th, 55 m. past 12 night

Sun enters ♄
 22d. 9h. 12 m.

Th	All Saints	7	13	4	47	14	40	☾ rises	F
2	F Pr. Edw. b. 1767. <i>All Souls</i>	15	45			59	5 a 0	16	
3	S Prs. Soph. b. 1777. <i>Mich.</i>	17	43	15	17	5	25	17	
4	G 21 S. aft. Trin. [T. 1 Ret.	18	42			36	6 2	18	
5	M Powd. Plot, 1605	20	40			54	6 50	19	
6	Tu Mich. Term beg. <i>Leonard</i>	22	38	16	12	7	51	20	
7	W Duke of Cumb. b. 1745	24	36			30	9 0	21	
8	Th Prs. Aug. Soph. b. 1768	25	35			47	10 20	22	
9	F Ld. Mayor's Day at <i>Lond.</i>	27	33	17	4	11	44	23	
10	S	29	31	21		Morn.		24	
11	G 22 S. aft. Tr. <i>St. Martin</i>	30	30			38	1 9	25	
12	M Mic. Term, 2 Return	32	28			54	2 36	26	
13	Tu <i>Britius</i>	33	27	18	10	4	3	27	
14	W	35	25			26	5 36	28	
15	Th <i>Machutus</i>	37	23			41	☾ sets	N	
16	F	38	22			56	4 a 22	1	
17	S <i>Hugh</i>	40	20	19	11	5	6	2	
18	G 23 S. aft. Tr. <i>Mich. Ter.</i>	41	19			25	6 5	3	
19	M [3 Ret.	42	18			39	7 15	4	
20	Tu <i>Edmund</i>	44	16			52	8 34	5	
21	W	45	15	20	6	9	55	6	
22	Th <i>Cecilia. Old Mart. Day</i>	47	13			18	11 13	7	
23	F <i>St. Clement</i>	48	12			31	Morn.	8	
24	S	49	11			43	0 28	9	
25	G 24 S. aft. Tr. <i>D. Glouc. b.</i>	51	9			55	1 39	10	
26	M 1743. <i>Mic. T. 4 Ret.</i>	52	8	21	6	2	49	11	
27	Tu	53	7			17	3 58	12	
28	W <i>Michaelmas Term ends</i>	54	6			27	5 8	13	
29	Th	55	5			38	6 20	14	
30	F <i>St. Andrew</i>	56	4			47	☾ rises	F	

Days	L. of D.	Day dec.	D. breaks	Tw. ends	Sun East	Cl. art. S.	7 Stars So
1	9 34	7 0	5 17	6 42	5 12	16 14	1 m 4
6	16	18	24	35	7	8	0 44
11	0	34	32	28	1	15 40	24
16	8 44	50	37	23	4 57	14 51	3
21	30	8 4	43	17	52	13 40	11 a 42
26	16	18	49	11	49	12 11	21

Last Quarter, 8th, 49 m. past 1 aftern.
 New Moon, 15th, 15 m. past 6 morn.
 First Quarter, 22d, 4 m. past 3 aftern.
 Full Moon, 30th, 54 m. past 5 aftern.

Sun enters ♍
 20 d. 21 h. 30 m.

1	S		7	57	4	3	21	56	3	a	54	16
2	G	Advent Sunday		58		2	22	5	4	40		17
3	M			59		1		14	5	38		18
4	Tu		8	0	c			22	6	43		19
5	W			1	3	59		29	8	1		20
6	Th	Nicholas		2		58		36	9	22		21
7	F			3		57		43	10	43		22
8	S	Conception of Virgin M.		3		57		49	Morn.			23
9	G	2 Sunday in Advent		4		56		55	0	7		24
10	M			5		55	23	0	1	31		25
11	Tu			5		55		5	2	58		26
12	W			6		54		10	4	25		27
13	Th	Lucy		6		54		14	6	1		28
14	F			7		53		17	7	34		29
15	S	Sam. Term ends		7		53		20	(fets		N	
16	G	3 S. in Advent, O Sap.		7		53		23	4	a	30	1
17	M	Orf. Term ends		8		52		25	5	57		2
18	Tu							26	7	21		3
19	W	Ember Week						27	8	42		4
20	Th							28	10	c		5
21	F	St. Thomas, Shortest Day						28	11	13		6
22	S							28	Morn.			7
23	G	4 Sunday in Advent						27	0	22		8
24	M			8		52		26	1	32		9
25	Tu	Christmas Day		7		53		24	2	41		10
26	W	St. Stephen		7		53		22	3	52		11
27	Th	St. John		7		53		19	5	4		12
28	F	Innocents		6		54		16	6	17		13
29	S			6		54		13	7	22		14
30	G	1 Sunday after Christmas		6		54		9	(rises		F	
31	M	Silvester		5		55		4	4	a	22	16

Shortest D. at Lond.
 is 7 h. 44 m. 17 f.
 allowing 9m. 5f.
 for refraction.

Days	L. of D.	Day dec.	D. breaks	Tw. ends	Sun East	Cl. aft. S.	7 Stars So.
1	8 6	8 28	5 54	6 6	4 45	10' 23"	11 a 0
6	7 56	38	56	4	43	8 20	10 38
11	50	44	58	2	41	6 5	16
16	46	48	6 0	0	40	3 39	9 54
21	44	50	1	5 59	39	1 9	31
26	46	inc. 2	0	6 0	40	1 b 21	10

CHRONOLOGICAL NOTES, &c. in 1781.

Dominical Letter	- - - G.	Shrove-Tuesday	- - Feb. 27.
Golden Number	- - - 15.	Easter-Day	- - Apr. 15.
E-pact	- - - 4.	Whit-Sunday	- - June 3.
Cycle of the Sun	- - - 26.	Trinity-Sunday	- - June 10.
Roman Indiction	- - - 14.	Advent-Sunday	- - Dec. 2.

ECLIPSES, &c. in 1781.

IN this year are two eclipses only; which are both of the sun, and both visible.—I. The first happens on the 23d of April, at 6 h. 37 m. and the sun sets eclipsed at 7 h. 10 m.—II. The second is in the morning of the 7th of October. It begins at 53 m. past 6, and ends at 20 m. past 8; the digits eclipsed 3° 46', on the sun's northern limb.

VENUS will be a morning star till the 2d of June, and then an evening star all the rest of the year.

JUPITER is a morning star till May 13, then an evening star till Nov. 30, and after that a morning star to the end of the year.

ANSWERS to the ENIGMAS.

I. MADAM	IV. BONES	VII. NOSE	X. DOOR
II. NAIL	V. BED	VIII. NOUN	XI. Pr. SIR LOIN
III. NOTHING	VI. LITTLE FINGER	IX. SWORD	or ROAST BEEF.

The Prize Enigma answered by Mrs. B. of Salisbury.

You'd Tasso's muse inspire my verse, Superior to an host of foes;
Those happy days I'd soon rehearse, When Beef and beer each table crown'd,
When Britain's glorious queen arose But noxious slip-slops ne'er went round.

The same answered by Mr. Robert Hartley.

Thus queer Cervantes wrote:—Knights-errant strain'd
Their ev'ry nerve,—and often ladies gain'd.
But see the contrast! Now the ladies rise,
And strive for laurels; now a knight's the prize!
O may they gain *Sir Loin*!—and he inspire
Their lovely breasts with emulative fire!

Miss Polly Empson thus answers the same.

France, for dress & taste renown'd, Britannia's sons, with laurels crown'd,
Her fashions, dainties boast; Shall ever rule the Roast.

It is thus answered by Mr. Francis Smith.

I went to * Drury, as I well remember, * *Play-house.*
The twenty-eighth or ninth of last December:
No sooner seated, but the † Gods complain, † *Upper gallery.*
And wild disorders thro' their province reign.
In vain soft music tries its soothing skill;
Soft music but exasperates their will: § *One of the mu-*
This pow'rful call enforces this relief: § *sicians with a*
Roast-beef, they cry, § *very large nose.*
Nosey, *Roast-beef*, *Roast-beef*.

Miss Lucretia Blackman thus answers it.

Then good queen Bess the sceptre sway'd, But now *Roast-beef* to tea gives
And nations own'd her power, Tho' fam'd in days of yore; [place,
The fam'd *Sir Loin* was England's boast, Nor ladies e'er will wrong their
Nor tea was yet brought o'er. To breakfast on it more, [taste,

The same answered by Miss Molly Gurr.

When great Eliza Britain's sceptre sway'd,
Sir Loin attended on the royal maid;
 No eastern teas engross'd the princely tale,
 But all were merry with *Roast-beef* and ale.

Mrs. Blanch Lean's answer.

In vicious pleasure's paths led on, Young Colin rov'd thro' all the plain, His parents moan'd their absent son; They mourn'd his loss, but mourn'd in Till sunk by folly to disgrace, [vain: He to his last resource was driv'n,	At home he dar'd to shew his face, He own'd his fault, and was forgiv'n, O'erjoy'd to see their long-lost child, His tender parents both did join To have the fatted ox soon kill'd, And welcome him with the <i>Sir Loin</i> .
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The same by Mrs. Mary Rubwell.

When great queen Elizabeth sat on the throne,
 And Britons for conduct and valour were known,
 Her lords and their ladies' morning's regale
 Was a piece of *Roast-beef*, and a cup of brown ale.

Miss Betty Smales thus answers the same.

O Tasso! the subject was good You gave us last year in disguise:	<i>Roast-beef!</i> 'tis most excellent food; Well might it be called the prize.
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Amintor's Answer.

When a breakfast of *Beef* your friend Tasso presents,
 What palate so nice but would relish the mests?
 And were all such good cooks, would ye, ladies and gents,
 Refuse to renew the fam'd age of queen Bess?

The same answered by Miss Diana Browne.

Dear sister-ladies join with me, Stand forth, preserve our darling tea Against this rude attack.	When Tasso sings <i>Beef a-la-mode</i> , Beware the syrens' dang'rous road, And shun Charybdis' gap.
--	--

Rusticus thus answers the same.

How blest who can each morn regale
 On good *Roast-beef*, or toast and ale.

The same by Mr. Isaac Gumley, of Countesthorpe.

On sops and ragouts let the Frenchmen regale,
 While Englishmen feast on *Roast-beef* and good ale.

Various other ingenious and separate answers were given by Messrs. J. Baker, Rev. T. Baker, J. Bayley, Clementina, Coelebs, W. Cole, Miss Eliza Cooke, E. D. D. Daniel, R. Dening, J. Eadon, T. Eland, Eliza, A. Gibbs, J. Graby, G. Harris, Indiana, W. Johnson, W. Jones, W. King, W. Kippax, W. M., J. Mallabone, Marcus, W. N., T. Nettles, S. Oliver, Miss P. Orton, Philaetibes, W. Rebsur, R. Richardson, W. Richardson, J. Roberts, Mrs. Roberts, S. Roberts, A. Russer, Scholasticus, G. Simpkin, Miss A. Stuart, W. Swift, R. Towns, C. Vanderstop, H. Weelman, Kit West, and T. Woolston.

All the Enigmas answered by Mr. T. Woolston.

[On the lamented death of the late learned and reverend John Lawson, B. D. Fellow of Sidney-Sussex Coll. Cambridge, and Rector of Swancombe, Kent. Who died and was buried at Chislehurst, Kent, in Nov. 1779, aged 55.]

1. No bones, nor finger-nails, nose, bed,
nor sword, [muse ;
Nor madam Di's roast beef can now a-
Gilt doors are nought ; great names no
joy afford ; [" drooping muse."
A theme more solemn claims the
2. O! soft-ey'd maid, with mournful
cypress crown'd, [wont to stray ;
Those shades I seek where thou art
For sprightly airs with me no more
are found, [tive lay.
But steep'd in sorrow flows my plain-
3. Lawson is gone! — Come all ye
nymphs and swains,
That woo fair science, come with
me and mourn ;
Sorrowing I go where rests his cold
remains, [peaceful urn.
To deck with sacred wreaths his
4. The empty pomp of titles, wealth,
or pow'r, [bring ;
No joys substantial to the wise can
Vain pageants of a short precarious
hour, [wing.
That's ever fleeting on time's rapid
5. This well he knew. His more
exalted mind [mer joy ;
Soar'd far beyond, and sought subli-
With heart sincere, and sentiments
refin'd, [never cloy.
He woo'd those pleasures that can
6. With thee, celestial Matheſis he
rov'd [pole,
In vast expanse, far as the starry
And ev'ry reas'ning faculty im-
prov'd, [soul.
To warm, enlighten, and dilate the
7. Eager to learn, at once we see him
reach [explor'd ;
Those truths sublime the antients had
And what he knew, as "gladly would
he teach", [cord,
Witness each name Diaria's lines re-
8. He, much belov'd, was nature's
meekest son — [ear,
The voice of sorrow never touch'd his
But by its plaint his gentle soul was
won, [tear.
And freely flow'd the sympathetic
9. The ling'ring muse still dwells
upon his worth,
Drawn by his precepts, ignorance
grew wise ;
From error's mist, he call'd fair sci-
ence forth, [ner skies.
To spread and bloom beneath sere-
10. But ah ! he's gone—his heav'n-
illum'd soul
Away to yon celestial regions flew,
Where boundless seas of bliss eternal
roll, [adieu.
And bad a vain ill-natur'd world

The same by Dr. Conundrum. — To Miss Lugg.

The more I consider, how witty, how fair,
How ev'ry way charming, dear MADAM, you are, 1
The more reason I find my presumption to own,
In expecting you e'er will be SONZ of my bone, 4
No coſſers have I, full of silver and gold ;
Nor houses and gardens superb to behold ;
No meadow nor pasture of boundless extent ;
In short I've no riches but those of content.

B

Yet, say, where these envied advantages fail,
 Can **NOTHING**, dear madam, their want countervail?
 Some sophists, I know, for a truth have set down,
 That love is at best but an adjective noun;
 As in reason, they say, it can't stand by itself,
 But must always be join'd with the **SUBSTANTIVE**, pelf.
 But the soul's finer feeling they never can know,
 Nor the joys that from mutual affection still flow;
 Who the pomp and the pride of high life would prefer,
 Or the meaner enjoyments of **BEEF** and of beer.
 What care, if we wed, shall our bosoms infest?
 Can I e'er be poor, when of you I'm possess'd?
 Let princes and kings their rich cabinets prize:
 If they boast of their diamonds, I'll shew them your eyes:
 And when their fine rubies they proudly display,
 I'll swear, that your lips are much finer than they.
 Those sweet dimpled cheeks, and that delicate **NOSE**,
 Are a treasure beyond what their caskets inclose;
 Nor is there a jewel beneath the vast sky,
 That the **NAIL** of one dear **LITTLE FINGER** can buy.
 Forget you! And could I that thought entertain!
 Forgive, my dear madam, your penitent swain,
 Ah! no: If my suit you at last should deny,
 I'll burn all my verses, and study to die:
 But since, you must own, 'twould be rather absurd,
 For a grave, sober doctor to fall on his **SWORD**;
 Or, like Bateman, whose story's so dolefully penn'd,
 At the door of your chamber himself to suspend:
 In some lonely grotto I'll lay down my head,
 Or else (which may do full as well) on my **BED**;
 Where in silent affliction I'll wait my last day,
 And depart in a decent and christian way.

The Poet in Love, by Marcus.

<p>What load unusual overpower's, And thus NAILS up my senses? 2 Either 'tis love my mind devours, Or I'm <i>non compos mentis</i>! It must be love—it surely must— NOUGHT else could feel so stupid: 3 Yes! yes!—I've had a <i>cut-and-thrust</i> 9 From that young blinker, Cupid. How shall I last? what shall I think? Or which contrivance light on? Oh!—pardon muse—here's pen and ink, And here—a leaf to write one. Then let me quick my grief <i>unfold</i>, 10 The only means to quell it;</p>	<p>For sorrow cheers on, being told, And metre best can tell it. Oh Polly—Polly—a—what's your NAME, That hangs there o'er the chimney? Not thou the causer of my flame, But kinder Polly—hymnia; Dear MADAM, do, descend and bring Your rhetoric to aid me, Teach the most moving way to sing And for the best persuade me. Bright maid! whose beauty hath snar'd, (I'll try a supplication)</p>
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Do, smiling, pay one some regard,	Oh heav'ns! — that rude ROAST
Or frowning, curb ONE's passion.	BEEF—NOSE!
Oh think what wakeful hours I keep,	Oh! oh! that shilling gallery!
O'er dull heroic numbers,	Could I—But all I've sung or said,
Mope in my chair till half asleep,	Will make me ne'er the better:
Then name you in my slumbers.	Affronted nature <i>points</i> —"to BED",
At plays I doat on dweedle-dee	6, 5
In spite of wit and droll'ry:	And prudence cries—"forget her".

Mr. Lacey's Address to Dr. Conundrum.

Wide is your DOOR of hope; for, now you know,	10
Your sense the values more than sop or beau:	
Go on — anticipate the pleasing joy,	
Built on those charms that NOTHING can destroy;	3
Where numerous graces that the mind possess,	
Lustre reflect on those her person blest;	
Those various beauties that attract the sight,	
Hands, FINGERS, NAILS, and TEETH, like ivory white.	6, 2, 4
Draw then your SWORD, each obstacle lay dead	9
That stands between you and the nuptial BED;	5
And then while I pronounce you blest, old boy,	8
Each fair shall add, 'MADAM I give you joy'.	1
And by this union, ere the next year's close,	
May we with joy exclaim 'there's dad's own NOSE':	7
Then we, dear Doctor, both our hearts will chear,	
With stately SURLOIN, and old English beer.	Pr.

The same answered for Phil. Williams, of Pitchford, by his Wife.

'Twas late one night, when reading	Ma'am Lean may take my word;
o'er [door.	And Polly's little finger does
The enigmas, wife had lock'd the	Outdo, in <i>substance</i> , Johnson's nose,
And we were going to bed;	Or Woolston's flaming sword.
She heard them all—then cry'd my	And so I hope the prize you'll own,
dear,	Due to your fellow flesh and bone,
I've hit, as sure as I am here,	Let who will be the gainer.
The right nail on the head.	My answer sure will be in print,
For Tasso's prize doth plain appear,	Or else I think the d—l's in't,
To be good beef, or else strong beer,	For nothing can be plainer.

The same by Miss A. B. in a Letter to her Sister on a discarded Lover.

Your letter arriv'd just at tea-table	Whom I lately dismiss'd, or turn'd
hour, [my power,	out of door;
An answer you'd have, if it is in	(I heartily wish I had done it before).
By return of the post; so impatient	To describe his sweet person, is not
you're grown, [make known,	my intention, [need mention;
Till the name and the person of him I	His dress and his manner, are all I

The first was superb ; the di'monds,	Till from laughter he saw I could
how fine ! [them divine ;	hardly refrain :
On his white <i>little finger</i> ; he thought	So abruptly arose, made a bow, and
His snuff box from France, he judi-	withdrew, [not new,
ciously chose, [inclose)	'Twas <i>bed-time</i> ; refusals to him were
(The lid did a miniature painting	But a fop, like a beggar, will not
'Twas fill'd with fam'd Hardkam's,	take denial, [true as a dial ;
his <i>nose</i> to supply ; [the eye ;	He has sworn he'd be constant, and
His nicely turn'd <i>nails</i> too, attracted	Has sigh'd, and has languish'd, not
His elegant <i>sword</i> was put on with	like the old peer, [last year,
an air, [fair.	You so cruelly banish'd, at <i>Buxton</i> ,
Intended, no doubt, as a guard to the	Who soon forgot love for <i>sir-loin</i> and
He address'd me, " Dear <i>ma'am</i> I ask	strong beer.
your permission, [my ; etition :	But now my dear sister, 'tis time to
I beg, my dear angel, you'd grant	take leave, [you'll believe)
There's <i>nothing</i> , I vow, wou'd so add	Tho' first I must add (what I trust
to my bliss, [band to kiss :	My wishes, that many new-years you
As the honour, the favour, your fair	may see ;
Thus on he proceeded in rapturous	And remain, with affection, you'll
strain,	ever,

Miss Betty Smales's Answer.

Hail charming spring, thou'rt welcome to my soul !
 Life-giving zephyrs float along the plains ;
 The limpid streams in soft meanders roll ;
 The shepherds tune their pipes in chearful strains ;
 The tender plants shoot from their dreary BED,
 The flowery tribe their beauteous forms resume,
 And all around ambrosial odours shed,
 That fill our NOSES with a rich perfume ;
 The plowman's song re-echos thro' the vale,
 NOTHING he fears, his case he ne'er bemoans,
 But richly dines on good ROAST BEEF and ale,
 And in the shade he rests his weary BONES,
 New strength and vigour do his limbs inspire,
 Till night steals on, array'd in sable vest,
 And charming Philomel bids him retire
 Within his DOORS, to take his balmy rest.
 The flutt'ring coxcomb drest quite in the taste,
 With spacious hat and powder in his hair,
 With diamond ring his LITTLE FINGER's grac'd,
 Tho' deck'd with SWORD, he never dreams of war,
 But plac'd in coach, with MADAM by his side,
 He stares around, and views the world with scorn ;
 NAIL'd to the town, with insolence and pride,
 The NAME of pleasure he enjoys alone.

Mr. David Daniel's Address to Diaria.

Plain, <i>madam's</i> , the case,	For with <i>finger</i> and thumb,
As the <i>nose</i> on your face,	I found it would come,
That I've hit the right <i>nail</i> on the head;	Without any further ado.
For <i>nothing</i> so sure,	It jump'd into my head,
Tho' wrapt in th' obscure,	As I lay in my <i>bed</i> ,
As by Tasso's <i>roast beef</i> we are fed.	And (tho' not accusom'd to swear)
No need of a <i>sword</i> ,	Odds <i>nouns</i> , I crv'd out,
(Tho' his wit is ador'd)	Beef <i>bones</i> witho't doubt,
His Gord an knot to cut thro';	Pleas'd the taste of Eliza the fair.

The same answered by Kit Went.

As John and Joan together sat,	The 5th a <i>bed</i> seems to appear;
Each oth'r pleasing with chit chat,	The name o'th' 6th—I can't declare;
Prihe', says Joan, if it wo'nt tireye,	To answer which Joan did not linger.
Read o'er the riddles in the Diary:	But quick held out her <i>little finger</i> ;
I greatly long for t'other bout,	John, wond'ring, said, then I suppose
To try if we can find 'em out.	Thou'lt know the 7th; it is a <i>nose</i> ;
John took it up, and read them o'er,	But really th' 8th, I cannot mention;
Then their names did thus ex-	Quoth John, tis past thy comprehen-
plore.	sion,
The first, says he, I think is <i>m'am</i> ,	It is a word in grammar rules,
That word you know has many a	A <i>noun</i> they call it in the schools;
charm,	The next a <i>sword</i> and then a <i>dear</i> ,
The next is <i>nail</i> , but what's the third?	But how shall we the prize explore?
<i>Nothing</i> , cries Joan, upon my word.	Why John, quoth she, to speak in
John much admir'd this wit of Joan's;	brief,
Then said, the next I think is <i>bones</i> ;	I re'ly think 'tis good <i>roast beef</i> .

Phelim's Address to his Sweetheart, by Mr. Wm. Allison.

Dear MADAM, poor Phelim Machate	BONES	admires you;	1, 4
And till NOTHING but love with some pity inspires you,			3
Poor Phelim shall certainly die in his	RED,		5
With a NAIL thro' his heart, or a	SWORD	thro' his head:	9, 2
To gain but your favour what pleasures I'd lose!			
I'd cut off a	FINGER,	or forfeit my	NOSE,
And the printshops my	NAME	cut in	wood
should expose.			
Then pity poor Phelim, my sweet little parrot,			
And he'll toast you in bumpers of	ROAST BEEF	and claret.	Pr.

The same answered by Rusticus.

The country's my lot,	With my dog and my gun,
A good wife I have got,	To the fields now I run,
Of ale and roast <i>beef</i> I have store;	And while I am looking about me,
Am blest in retreat,	With his <i>nose</i> to the ground,
Nor envy the great,	Ho, Sancho has found,
For what can a mortal have more.	My <i>fingers</i> at trigger, don't doubt me.

Then home with my game,	Shut my <i>door</i> safe; at ten
I return to my <i>dame</i> [please.	In <i>bed</i> ; up again;
Who consigns them to <i>spit</i> , if she	Wag our jaws about - the next morn:
Then all day I attend	This is <i>nothing</i> but true
To my bus'ness or friend,	In <i>substance</i> : adieu;
Or in garden oft <i>nail</i> up my trees,	So to the next year I'll adjourn.

The same by Mr. John Bayley, of Middleton, Yorkshire.

Madam, nail, nothing, bones, bed, finger, noun, nose,
Sword, door, and roast beef, all th' enigmas disclose.

Miss Elizabeth's Cook's Address to Diaria.

Excuse me dear <i>madam</i> , I scarcely can	And what words are nouns, as <i>nail</i> ,
write, [delight;	<i>nose</i> , and <i>teeth</i> , [and <i>beef</i> ,
Tho' in your learn'd di'ry I take great	And also <i>bed</i> , <i>finger</i> , <i>door</i> , <i>sword</i> , and
There is <i>nothing</i> I do that e'er gives	My mistress thinks also, that sewing
me such pleasure, [ed treasure.	and knitting, [and fitting,
As gleanings a little from your learn-	For such girls as I, are most proper
My master says, Betsy, first spell and	But genius, dear friend, and, a high-
then read, [do tread;	soaring thought, [it ought;
Before you the paths of bright science	Lead girls such as I am, beyond what
You likewise must learn, tho' you yet	And if learned diarians approve of
are so young, [ther tongue;	my lay, [away,
The 8 parts of speech in your own mo-	I'll cast sewing and knitting for ever

Miss Polly Empson's Dialogue with her Mother.

M. Polly, shew me your work — pray what have done?
P. Indeed, mamma, *NOTHING*. — *M.* Not since I've been gone!
 Then *NOUNS*, or else riddles, have puzzl'd your brains;
 And b'lieve me; you'll ne'er get a prize for your pains.
P. Dear *MADAM*, I've prickt me, pray see how I bleed!
 Just under the *NAIL* too. — *M.* You have child indeed!
 Your poor *LITTLE FINGER*'s much wounded I own,
 That *SWORD* of a needle has pierc'd to the *BONE*:
 And I really believe, Billy didn't bleed more
 Last week, when he ran his *NOSE* gainst the *DOOR*.
 Well, too soon for *HEB*, I'll get a sedan,
 And swing to the playhouse as fast as I can:
 The overture's charming. But oh what a grief!
 Should I hear the loud rabble baul out for *ROAST BEEF*. *P.*

The same answered by Hebe.

Ye fair who grace the muse-taught	Whose simple muse, in yonder grove,
page, [age,	Where fawns and woodnymphs fond-
Whose tuneful strains, from age to	ly rove,
Exalt <i>ma'am</i> di'ry's <i>name</i> ,	First tun'd her rural strain;
Beneath your laurel's spreading shade,	Or by the sweetly winding flood,
Receive an humble, artless maid,	That skirts the tall <i>embow'ring wood</i> ;
Who seeks no greater fame.	Or on the flow'ry plain,

Hail happy groves ! the blissful seats
Of spotless truth ; secure retreats
Of innocence and love ! [lay,
Where feather'd warblers chant their
Where flocks and birds securely stray,
And ev'ry bliss improve.
The shrubs their choicest odours shed ;
Far Flora's variegated bed
With matchless beauty glows :
The woods, the groves, the flow'ry
ground,
The blooming landscapes all around,
Do nature's charms disclose.

'Twas scenes like these the Mantuan
fir'd ;
Such *Naso's* early thoughts inspir'd,
And fann'd the kindling fire ;
When erst to 'plan the public weal',
Or paint the warrior's *shining steel*,
They struck the sacred lyre. —
Be mine to shun the blaze of day ;
And, wrapt in meditation, stray
Beneath some lonely shade ;
Where *empty* fame disdains to greet
My happy, peaceful, calm retreat,
Nor envy dares invade.

With much regret we are obliged to omit the many other ingenious answers by Messrs. E. Ambrose, Amintor, Arion, Rev. T. Baker, Miss Di. Browne, Cælebs, E. D., J. Dees, R. Dees, R. Denning, R. Dowden, J. Eadon, T. Eland, Eugenio, J. Fletcher, J. Franks, J. Gruby, I. Gumley, B. Hargrave, G. Harris, R. Hartley, W. Hawkes, Horticultura, B. J., J. Jackson, F. James, F. Johnson, W. Johnson, W. Jones, W. Kippax, Mrs. Lacey, Mrs. Lean, Lorenzo, J. Mallabone, J. Matthews, W. N., T. Notitle, S. Oliver, B. Patteson, Philarithmus, S. R., W. Rebsur, R. Richardson, W. Richardson, J. Roberts, Scholasticus, F. Smith, W. Swift, C. Vanderstop, W. Watkins, J. Wilcox, and others.

ANSWERS to the QUERIES, REBUSES, &c.

I. Query answered by Mr. J. Jackson.

Clouds consist of watery particles, raised in exhalations ; and every particle thus exhaled, is a hollow globule, which internally is almost a vacuum, and from its hollowness is lighter than the same bulk of common air at the surface of the earth, and therefore those particles ascend till they arrive at that region of the air which is of the same specific gravity with themselves, where they float about, and by cohering form clouds ; but when dashed together and broken by the agitation of winds, &c. they coalesce and fall down in drops of rain.—This is illustrated by the following experiment. Place a pan of boiling water on a stove, in a still room, and putting a little soft soap in the bottom of the head of a tobacco pipe, immerge the head in the boiling water ; then blowing thro' the pipe, the hot air will rise, much rarified, in hollow globules of water, which float in the ambient air, and form clouds, that break and fall in rain when agitated by blasts of wind.—On the same principle was the solution given by Messrs. Cælebs, Denning, Leighton, Marcus, Notitle, Oliver, Philarithmus, W. Richardson, Rowe, Smith, Swift, Terril, and Watkins.

II. Query answered by Mr. William Swift, of Stow.

There is a bubble of air at the greater end of every egg, between the shell and the skin, to which the warmth is to be attributed, and by which we judge of the goodness of the egg ; but the air being gradually dispersed,

through the pores, or otherwise, the egg becomes stale, and at length putrid or addle, which is indicated by feeling cold to the tongue. — It was also answered by Messrs. *Cælebs, Jackson, Leighton, Marcus, Nottle, Philarithmus, W. Richardson, Rowe, Smith, and Watkins*, mostly on the same principle. Some indeed think the heat chiefly owing to the yolk being nearer to the greater end. And Mr. *Fr. Smith* thinks the very shell itself is warmer at the greater end, and that the difference exists even after the shell is broken in pieces. He is farther of opinion that the warmth of the end is not the distinguishing quality of a good egg, for that stale ones have this property as well as others.

III. Query answered by Cælebs.

There seems not to be any rational or anatomical reason for using the right hand more than the left, and children left to themselves would use the one as much as the other. But custom, in the use of many tools, instruments, machines, and writing from left to right, require the greater use of the right hand. And the reason why children use the left hand more, is that their nurses carry them chiefly in their left arm, (in order to have their right hand at liberty to use), by which means the left hand of the child is most at liberty to take hold of every thing that comes near it. — Nearly in the same manner is the answer given by Messrs. *Jackson, Leighton, Marcus, Nottle, Philarithmus, W. Richardson, Rowe, Smith, Swift, and Watkins*.

IV. Query answered by Mr. Francis Smith.

I am inclined to think that the rays of light act on those people's eyes, mentioned by Dr. Priestley, in a similar manner to the rays from a candle to a common eye; for though with good eyes we can see to read very small print by candle light, yet we cannot distinguish all colours. — This was also answered by Messrs. *Cælebs, Jackson, Leighton, Philarithmus, W. Richardson, Rowe, and Watkins*.

V. Query answered.

Messrs. *Cælebs, Jackson, Leighton, Nottle, Philarithmus, W. Richardson, Smith, Swift, Thompson, and Watkins* think the effect in question arises from an alteration in the temper of the metal of the razor by heat; and it is observed that hot water improves the effect of all edge tools. — But *Marcus* and Mr. *Alex. Rowe* are of opinion, that the difference arises from the hot water softening the substance of the hair, and rendering it easier to be cut.

The 1st Rebus answered by Miss Dolly Conundrum.

*B*urning thirst when seamen seizes,
*O*cean's waters vainly roll;
*W*inds, with kinder, prosperous breezes,
*L*and them gasping for their *NOWL*.

All the Rebuses answered by Mr. I. Gumley.

While others extol the delights of good wine,
 I'll bow with devotion to beauty's fair shrine;

Myrtilla's sweet converse my time shall improve,
And melt all my soul with the raptures of LOVE.
O had I but MILTON's poetical skill,
Her fame should eclipse the fair maid of the MILL:
For LE'M'STER and TRURO were never possess'd
Of a maid with so many accomplishments blest.

The same answered by Mr. T. Woolston.

In a pleasant warm vale, at the foot of a hill,
I dwell by a brook, near a neat little MILL;
With a wood just behind, whence the strains of the grove
Give an air to my cot, like the mansions of LOVE:
Not at MILTON, nor TRURO, nor LE'M'STER the swains
Ever tun'd their soft reeds on more pastoral plains;
Here contented I rove, nor at fortune repine,
Since she gives me sweet streams, tho' she gives me no wine.

The same answered by E. D. of Horsheath.

Leominster, Love, Truro, Mill, Milton, and Bowl,
Define, of your rebuses, clearly the whole.

The Answer by Cælebs, to Dr. Conundrum.

Haste, haste learned doctor, let LOVE bear the sway,
Since dangers you know oft arise from delay,
Be blest with fair Peggy, by joining of hands,
Unite at the altar in Hymen's soft bands:
Should MILTON of TRURO prefer his address,
Or J. MILLS of LE'M'STER his flame but confess,
You fore might repent when depriv'd of the fair,
And i'th' BOWL you might seek a refuge from despair.

The same by Mr. William Rehfsur, of Handborough.

Near Hudson's mill I've often been,	But since Zelinda's from me sent,
To meet my lovely maid;	The bowl must ease my care;
Truro and Leominster have seen,	Unless her parents should relent,
And Milton's works oft read:	And blest me with the fair.

The same by Mr. John Bayley, of Middleton.

Leominster, Bowl, Truro, Love, Milton, and Mill,
Will answer each rebus, or I've lost my skill.

Miss Betty Smales's Answer.

To Le'm'ster or Truro I never shall Like Milton for wit is the youth I
[at home;] approve, [to love,
To blest my fond lover I'll marry He's ev'ry endearment t'invite me
Where I'll treat my good friends with My heart he has won with his hu-
a bumper of wine, [what I design.] mour and skill, [in a mill.
And to have their consent, first, is And he keeps it as sure as a thief's

Other ingenious answers were given by Messrs. Arion, Miss Di. Browne,
R. Dees, R. Dowden, J. Eason, J. Fletcher, J. Gruby, W. Hawkes, Horti-

cultura, J. Jackson, F. James, W. King, Mrs. Leon, Marcus, T. Notida, S. Oliver, Philarithmus, R. Richardson, J. Roberts, A. Rowe, Scholasticus, W. Swift, W. Terrell, and W. Watkins.

NEW ENIGMAS.

I. Enigma 613, by Miss H. Higgins.

Ye rid'ling wits I pray attend,	Nor want nor woe had e'er been
To one who always was your friend ;	known.
And set me forth to public view,	In witchcraft I am known to deal,
To' oft I'm seen, and nothing new.	And am concern'd in public weal :
With women I do always dwell,	Yet never in the court abide,
From lady Daw to lowly Nell :	Nor in the city could reside ;
But on mankind I seldqm wait,	But I in ev'ry town appear, [there :
Not even in their greatest state,	And, if you look, you'll find me
Unless they to the law belong,	In short I'm sound with ev'ry
Then I assist them—in the wrong.	wretch — [teach.
Had I ne'er been, all people own,	But hold — 'tis needless more to

II. Enigma 614, by Cœlebs.

A darling fav'rite of the fair,	I seldom am expos'd to view,
Now begs permission to appear,	Am rarely seen, except by few,
Within the lists of fame.	Conceal'd thro' modest fear ;
The first blest pair of human race	But when fond pairs in hymen's bands,
Gave me, no doubt, that blissful place	Their hearts unite by joining hands,
Which to this day I claim.	Then public I appear. [more,
With kings and princes of each state,	But should you want yet one hint
With high and low, with small and	My name still plainer to explore,
I still am in esteem ; [great.	I this will add in brief ;
The young, the blith, the debonair,	If by neglect I e'er am lost,
The black, the brown, the blooming	By custom fix'd, the loser's cost
To them a pleasing theme. [fair,	Is to reward the thief.

III. Enigma 615, by Mr. Leonard Walker.

Some learned men, to shew my pow'r and worth,
 Declare me parent of this pond'rous earth.
 My size I vary ; sometimes large and bright,
 Anon escape the keenest human sight.
 To me, fair maids, those nodding plumes you owe,
 Which deck your heads at ev'ry midnight shew.
 The wing'd inhabitants of air and earth
 Are all to me indebted for their birth.
 That you my worth may yet the more admire,
 The finny tribe too own me for their fire ;
 From the small minnow which the boys beguile,
 To that dread form, the scaly crocodile.
 The gouty alderman's oblig'd to me
 For all his callipash and callipee.

The tawny dames of Egypt have an art,
By which they make me play a wond'rous part:
I'm cold and dead when they begin their charms,
But soon alive by their prolific arms. —
Tho' I've existed since the birth of time,
I've ne'er been guilty of the smallest crime;
Yet such, alas! is my unhappy case,
I'm oft destroy'd to please a puny race.
To you, ye fair, whose tender bosoms feel
For others woes, I make my last appeal;
In your protection I can fear no ill,
Tho' your bright eyes are often known to kill.

IV. Enigma 616, by Mr. Rd. Willett.

When am'rous Jove fair Iö's charms	I too the secret of a king made known,
possest,	[breast, And Bacchus' choir led dancing o'er
And turn'd into a cow her throbbing	the lawn.
In vain she had implor'd her former	It was by me Acestes gain'd the bowl,
shape,	[rape; And with a spear I charm'd Merion's
Had I not sympathis'd the unjust	soul.
For conq'ring Argus and his 100	Such, such was formerly my mighty
eyes,	[prize: force,
I gave to Mäia's son the milk-white	But now 'tis waxen weaker, and much
And if the ancient poets paint me	Yet sometimes still for prey I quit
right,	[fight; my dome,
The mother of the Greeks is in your	And midst the gloomy clouds am seen
As also she who goat-hoof'd Pan de	But stop, my muse, nor longer dare
ceiv'd,	[reav'd. to trace
And of his lovely Naiad him be-	One that so plainly now does shew

V. Enigma 617, by Marcus.

By your leave, gentle fair ones, I speak to the men,
Being scarcely admir'd by one lady in ten.
I'm a busy old fellow, and often through life,
Am known for a foe to both mistress and wife;
As often the wife and the mistress can prove,
That I'm far from a Cynic in matters of love.
But wrong not my meaning, for, right understood,
'Tis only a toast that can thaw my chill blood:
Yet, spite of all this, and a head white as snow,
I'm hearty and stout, firs, I'd have you to know;
Dare kick up a dust, in my quarrelsome fits,
And knock a man down, well as Cockran, or Pitts.
But alack! how I swagger! Friends, be not afraid,
For I cannot wax warm without losing my head.
I'm a Cockney; and, so my odd nature requires,
That, without e'er a mother, I came of two fires;
The one is a bumpkin, well known in Mark-Lane,
And t'other — but that would be speaking too plain:
The strength of the first as my right I enjoy,
While the latter has lent me a *je ne séá quoi*.

VI. Enigma 618, by Taffo.

Something—nothing—as you use me; Eternity I bring to view,
 Small or bulky, as you choose me, The sun, and all the planets too;
 Short liv'd child of grief and pain, The moon and I may disagree,
 Live for a moment—die again. Yet all the world resembles me.

VII. Enigma 619, by W. N.

To you who dark mysterious things unfold,
 This short description of myself I hold:
 I wear no shape, nor was I ever seen,
 I have no act on, figure, gesture, mien:
 To elements I ne'er have ow'd my birth;
 I'm not in fire, in water, air, or earth:
 Nor touch, nor taste, nor hearing, smell, nor sight,
 Can tell my nature, or describe me right.
 I am no substance, yet a shadow have
 Fleet as the wind, inconstant as the wave;
 A shadow ne'er but in my absence seen,
 That always is where I have never been.
 I form the path by pure religion tro'^d,
 I am, I was, and e'er shall be with God.
 By all I am pursu'd, by all address,
 By all I might be won, by all possess;
 And yet of all my large admiring train,
 By few I'm found, with fewer I remain.

VIII. Enigma 620, by Tom o'the Vale.

Two brethren, like and most unlike	The longest, shortest too of all our race,
we be,	(In brothers what disparity of face!)
Of all our tribe, our whole fraternity;	Our lengths we interchange: my bro-
A tribe so num'rous, yes, and times	ther where
so dear,	[the year] sed there:
What so dly purse retains thro'out	Contracted most, I'm most protract-
Of like component parts tho' both	And hence criterions new their light
are made,	contribute,
[and shade,	[exhibit
Compos'd of shade and light and light	Our likeness and unlikeness which
Herein discriminat's our motleydight	Two eyes we have, which brother
In one the shade prevails, in one the	lends to brother,
light:	[and other:
These two suppeditate each other's	Which serve at once for both the one
lack,	Yet we, unbrother-like, ne'er meet
[black:	together,
Now say, or which is which, or which	[is whether.—
Alternate thus, of erst lo! twins suc-	Now say, or which is which, or which
ceed,	Alternate thus, of erst lo! twins suc-
[creed;	ceed,
To live, to die, by mutual fate de-	[creed;
The one foregoes his breath, the o-	To live, to die, by mutual fate de-
ther lives,	The one foregoes his breath, the o-
[she gives;	ther lives,
What fate subtracts from one, to one	What fate subtracts from one, to one
Their deaths their lives, their lives	Their deaths their lives, their lives
their deaths supply,	Their deaths their lives, their lives
By turns they die to live, they live	By turns they die to live, they live
to die,	to die,

One item more, ye fair, inspect us | In fine, we're final both, and both
 near, [once a year. initial, [ficial.
 You'll find we're seen at most but | We're nat'ral both, and both are arti-

IX. Enigma 621, by Mr. Rob. Richardson.

Ye lovely fair who grace the tuneful | Nor dreamt of dangers hid in time's
 page, dark womb;
 A matron, almost 80 years of age, | While fame's loud trump had spread
 Your care demands;—nor dart that | my fame around, [crown'd;
 leering frown, [are flown | And rising years with rising honours
 Nor say those graces and those charms | To please and entertain you then, ye
 Which youth displays. Such bright | fair, [care.
 perfection's mine, [my shrine | Was all my wish, was all my hope and
 Unnumber'd vot'ries crowd, and at | But baneful envy, wounded by my
 Their annual tribute pay. Let poets | fame, [my name;
 sing [blooming spring; | Now rears a spurious brood, usurps
 The varied sweets that mark the | And, griev'd to see my spreading ho-
 Let summer's sultry suns intensely | nours grow, [my brow.
 shine, [vine: | Attempts to snatch the laurel from
 And autumn ripen the nectareous | But, to a doctor, fam'd thro'out the
 Let blust'ring Boereas urge his fiercest | land, [hand;
 rage, [sounding page: | Ere this event I deign'd to give my
 And storms and tempests swell the | Blest with his love, I scorn'd their
 In vain th' attempt; the varying | treach'rous wiles, [guiles;
 seasons see [in me. | And cruel fortune this sweet hope be-
 The charms of nature centur'd all | That doctor, he whose universal fame
 In me the sweets of blooming youth | Has spread so wide, I need not tell
 combine; [are mine.— | his name:
 Wit, courage, birth, and beauty, all | Now faithless proves, and sues a Cor-
 When royal Anne the British sceptre | nish fair; [beware,
 sway'd, [array'd, | But, dearest maid, warn'd by my fate,
 In all the charms of artless youth | Abjure the faithless swain while yet
 With trembling step, I left my native | you may, [May.
 home, | Nor in December plant the rose of

X. Enigma 622, by Mr. Isaac Gumley, of Countesthorpe, Leicestershire.

Let ancient monarchs boast of heav'nly birth,
 And look with scorn on all the sons of earth,
 Or bribe the Bard with fictitious tales to prove,
 Their near alliance unto thund'ring Jove:
 More justly I supernal birth may claim,
 From heav'n I sprung, and heav'n bestow'd my name;
 Th' almighty ruler of the earth and sky
 Approv'd me well, and angels sung for joy.
 To hail my coming, countless tribes repair,
 And music fills the circling fields of air;
 With pleasure men behold my smiling face,
 And rich and poor my heav'nly beauties trace.
 I spread my sov'reign sway from pole to pole,
 Where cities rise, and briny oceans roll:

My worth is known to men of every tongue,
 And Milton greets me in his heavenly song;
 For virtue does on all my steps attend,
 And heav'n-born truth has been my constant friend.
 But I've a sister that my presence shuns,
 With frownful face, and black as Afric's sons;
 Devoid of grace, she opens wide her doors
 To thieves, to drunkards, bullies, rakes, and whores;
 There every lewdness reigns without controul,
 And horrid vices blind the guilty soul:
 Yet for her deeds she must to hell be driv'n,
 For scripture says she ne'er shall enter heav'n.
 But I shall dwell before th' eternal throne,
 When stars are fled, and earth's no longer known;
 A bright memorial of celestial grace,
 And never, never quit that blissful place.

XI. Enigma 623, by Mr. French Johnson.

Ye fam'd enigmatists, pray now dis-	Till mighty Edward, from the Gallie
close	[arose: rout, [about
From whence, or where my origin	Inclos'd the space, and circl'd me
Was it in ages of remotest date	With royal fence, extending far and
I first appear'd; then reach'd the	wide, [ther side;
regal state?	Two trusty chiefs as guards on ei-
Was it from moral, or religious	Within the mound fierce lions shake
laws, [cause,)	their manes, [the plains;
{As great effects succeed a trifling	The gen'rous courser bounds along
I thus obtain'd my consequence with	The thistle, lily, rose, all flourish here,
man, [plan?	A regal contrast in the grand parterre;
His honour settl'd, and design'd the	Here music dwells, which sets the soul
Suppose it Nimrod, that recorded	on fire, [lyre.
chief, [thief.	From silver strings of the melodious
Some petty tyrant, or a powerful	When at the public worship you ap-
First took the hint; a fav'rite sym-	pear, [there:
bol wore, [pow'r	Your humb. serv. mostly meets you
The hi'reglyphic of his barbarous	Not always to the sacred place con-
'Mong all the chief enigmatists of	fin'd, [wind.
fame, [name:	I often mount and traverse in the
The greatest ridler has not found my	Or telon-like, in irons to remain,
Ingenious Bentley, Tasso, Doctor Co.	Confin'd and fix'd against the solid
Have all o'er look'd me, all the la-	plain. [my leave,
dies too.	Now, gents and ladies, I must take
Let us admit that gallantry or pride,	Yet not before a hint or two I give.
A thirst of glory, honour for its guide,	An English college with peculiar art,
Or martial prowess, enemy to tears,	Dissects each member, quarters ev'ry
Increas'd my power with revolving	part.
years,	

XII. (Prize) Enigma 624, by S.

Forget a while ye blust'ring storms to	Let no rude breath dare undulate the
roar;	air, [there;
Ye waters sleep; be echoless the shore;	Let not wild music dare to wanton

For lo! a fav'rite comes, whose feeble	Your lovely selves I paint with ni-
voice, [ing noise.	cest skill, [to kill.
Scarce meets due notice in bewild'r-	And add such charms as those you use
Where awful piles their tow'ring	(The deepen'd rose lost in the lily
pomp display, [ray,	white, [ing fight)
Blest with religion's ever-chearing	To find the union, tires the search-
Within the walls I breathe and wan-	Tho' I work gratis, yet 'tis not less
der round, [ground.	true, [too.
As if delighted with the hallow'd	That frequently I deal in flatt'ry
Tho' not religion's sacred cause a-	Altho' conversant in politest arts,
lone [grown—	You'll have a mean opinion of my parts
My service owns — for I'm a sinner	When I confess, that I am look'd on
In its domain, (blush some who feel	rude, [trude.
this truth, [youth.)	And where politeness oft forbids, in-
And leave those fatal errors of your	But does n't this surprize, when all
To shameful purposes I'm us'd there,	confess, [drefs;
And even to abuse religion dare.	I never come but in the softest
Not hallow'd scenes alone my pre-	Except where does a lofty structure
sence own, [known;	stand, [stroying hand,
I'm oft in those of sportive pastime	Which long has brav'd old time's de-
There, at your ears, your laughter I	There in a temple, sure you know
provoke, [joke.	its name, [to fame.
Dispensing pleasure by a well-tim'd	A latent cause has made me known
And oft (let Kneller's reputation die;	But would you soon this mystery un-
His tints will nev'r dare with mine	wreathe, [phrys breathe,
to vie)	Haste to the bow'r where gentle ze-
I painter am, and bid the picture glow	There 'tis reported I've a soothing
With red that can't from other's	pow'r, [hour.
pencils flow.	And there fair Celia hail'd my natal

NEW QUERIES and REBUSES.

I. Query by Mr. Mark Elstob.

It is observable that, on a moor or fell, or upon open, barren grounds, the air is much colder than in fertile enclosures. What reason can be assigned for this difference?

II. Query by Clericus.

What gave rise to the custom of expressing friendship and confidence by joining, or as it is commonly called shaking, hands? And how far in antiquity can the custom be traced?

III. Query by Mrs. Blanch Lean.

Does a swan really sing as a prelude to its non-existence? If not, from whence arose the notion?

IV. Query by Marcus.

I would gladly know what might give rise to the expression *Under the rose*, — and why that flower should be dedicated to secrecy in so particular a manner.

V. Paradoxical Query by Mr. J. Jackson.

Says Dick unto Harry, I've oft tried, in vain,
Not breaking the shell, on a flat and smooth plane,

To place an egg upright upon its round end;
If you can assist me, I'll call you my friend:
Also give a reason why it should do so,
And lady Diaria will thank you I know.

I. Rebus by S. J. L.

The half of a prop and support unto man,	[plan,	But when in its folds it a person sur-
And what is th' view of the satyr's	rounds,	[beauty abounds,
If rightly connected with ease will declare,	[the fair,	That neither with youth nor with Whilst forbidding to gaze, in its praises I'm lost.
A thing that I hate, that I love, with		[ternately toff,
When beauty concealing I chance it		Thus by love and by hate I'm al-
to see,	[ne'er be;	Here ladies I cease, for, from what
Its use, then detesting, I wish could	I've expos'd,	[disclos'd,
		I doubt not my mind you've already

II. Rebus by Mrs. B. of Salisbury.

To a known Spanish title, pray add, if you please,
What is said, when an over-full stomach you ease,
Then too-thirds of a word which implies to mistake;
And a fam'd town in Yorkshire you'll easily make.

III. Rebus by Mr. John Wilcox.

A judge of hell, a creature as 'tis said,	An isle in which Latona once lay dead;
A Theban prince who did his mother wed,	Th' initials join'd, a thing you'll find, Which tyro often deems unkind.

IV. Rebus by Mr. John Mathews.

To half of a place where provisions you buy,
Add two-thirds of a grain, and you'll quickly descry,
A thing all the fair sex would do ere they die.

V. Rebus by Mr. John Eadon, jun.

The reverse to old,	These join'd right and fair,
I pray you unfold,	A town's name will declare,
And whither all vessels are bound;	That in a small island is found.

VI. Rebus by Mr. Wm. Swift, of Stow.

Direct or reverse, you may read me, ye fair,
The one way a number, the other a snare.

*** The number of prizes are eight, to be determined by lot, viz. one of 10 and one of 8 diaries for the solutions of the prize-enigma; two of 10 diaries each for the general solutions of the enigmas; two of 8 diaries each for the solutions of the queries and paradoxes; also one of 12 and one of 8 diaries for the solution of the prize-question. The competitors for the prizes given for the solutions of the prize enigma and prize question, must send their letters, containing those solutions before Candlemas day; and all other letters for the use of the Diary, must be sent before the 1st of May. — Our correspondents are requested to make their compositions as short as possible with propriety; as many are unavoidably omitted from their too great length. They are not however always to conclude that their pieces are rejected when they do not see them inserted the 1st or 2d year after they are sent; because they are often kept back for several years, thro' the great number that come to hand, that we may give every one his turn. — Solutions to be sent with all new propositions.

ANSWERS to the MATHEMATICAL QUESTIONS.

I. Question 757 answered by Mr. Wm. Terril.

THE difference between the second and third equations gives $y = 1$, answering to the letter *A*; and their sum gives $z^3 - x^3 = 469$; at by the first, $x = z - y = z - 1$; which substituted in the last, becomes $3z^2 - 3z + 1 = 469$, or $z^2 - z = 156$; hence $z = 13$ answering to the letter *N*. Lastly $x = z - 1 = 12$, denoting the letter *M*. So that *MAN* is what the fair one sighs for, as Mr. Roberts says.

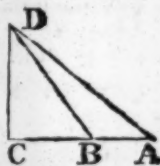
The same answered by Mr. Robert Dowden.

THE third equation taken from the second, there results $2y^3 = z$, or $y = 1$; hence the first gives $x = z + 1$, which written in either the second or third, it becomes $x^2 + x = 156$, consequently $z = 12$, and $x = 13$; and poor Phillida sighs for a *MAN*.

Nearly in the same manner was the answer given by Messrs. Almond, Barker, Bartlett, Cole, Dees, Derrick, Eadon, Fatherley, Fletcher, Furber, Glendinning, Guby, Harris, Hartley, Hawkes, Henderson, Hodshon, Horticultra, Jackson, F. James, J. James, Johnson, Jones, Kelly, King, Leighton, Edm. Littlewood, Lovegrove, Marsden, Mole, Nicholson, Notitle, Oliver, Patteson, Pbilaritbmus, Sir Pbilo Pbillida, J. Pbilip, Rebhur, Reynolds, Richardson, Roberts, Robinson, Rowe, Scott, Sharp, Todd, Trelease, Watkins, Westman, White, Williams, and Westcott.

II. Question 758 answered by Mr. Thomas Bosworth.

LET DA, DB, DC be the hour lines of 8, 9, 12 respectively. Then, by Gnomonics, CB, CA will be in the ratio of the tangents of 45° and 60° respectively; and, by the question, the $\angle ADB = 15^\circ 25'$. Then, by prop. 4 Simpson's Trig. as $CA - CB : CA + CB ::$



as $\angle ADB : \sin. \angle ADB + 2\angle BDC = 82^\circ 48'$; hence the $\angle BDC = 33^\circ 41' \frac{1}{2}$. Then, as tang. of 45° (the angle on the sphere) : tan. $33^\circ 41' \frac{1}{2}$ (the $\angle BDC$, its representation on the dial) : : sinus : sin. $41^\circ 48' 48''$, the latitude required.

The same by Mr. J. Nicholson.

LET P represent the north pole, PO and PN arcs of 8 and 9 o'clock hour-circles, HO an arc of the horizon, and PH the latitude of the place. Then, by spherics, 1 (rad.) : x (sin. PH) : : T (tang. $\angle HPO = 45^\circ$) : $Tx = \text{tang. HO}$, and 1 (rad.) : $x :: 1$ (tang. $\angle HPO = 45^\circ$) : $x = \text{tang. HN}$; hence, putting $t = \text{tang. NO} = 15^\circ 25'$, by art. 43 Crakelt's Trig. we have $Tx (= \text{tang. HO or tang. HN} + \text{NO}) = \frac{x+t}{1-tx}$; consequently $Ttx^2 - T - 1.x$



$-t$, and $x = \frac{T-1}{2Tt} \pm \sqrt{\frac{T-1}{2Tt}^2 - \frac{1}{T}} = .8659670$ or

67110 the sines of $59^\circ 59' 34''$ and $41^\circ 48' 47''$, the two latitudes.

line of $14^{\circ} 2' 10'' = \angle GAF$, conseq. $45^{\circ} + \frac{1}{2} GAF = GAF + FAH = GAH = 52^{\circ} 1' 5''$ the angle of projection; also, by the laws of projectiles, radius : sin. GAH :: $2 \sqrt{a} \div 16 \frac{1}{2} = 2.94045$ seconds, the time the stone was in motion.

The same answered by Mr. Robert Hartley.

PUT $a = 60 \times 60 \div 16 \frac{1}{2} \times 4$ the impetus, and $x =$ the sine of the angle of projection. Then $ax^2 =$ the vertical height of the stone, and $4ax \sqrt{1 - x^2} =$ the amplitude; therefore $x^2 + 4x \sqrt{1 - x^2} = a$ max. which put into fluxions, &c we have $x = \sqrt{\frac{1}{2} + \sqrt{\frac{1}{8}}} = .782205$ the sine of $52^{\circ} 1' 5''$. Therefore $ax^2 = 34.7647$ the height of the bird, and $60x \div 16 \frac{1}{2} = 2'' 56''' 25^{iv}$ the time the stone was in motion.

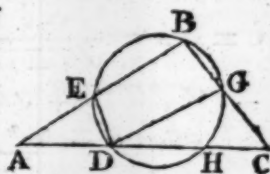
The same by Mr. John Fletcher.

PUT x and v for the sine and versed sine of double the elevation, $b = 55.959$ the perpendicular projection. Then $\frac{1}{2}bv$ is the altitude, and bx the horizontal projection; therefore $4bx + bv$ is a max. or $4x + \sqrt{1 - x^2}$ is a max. hence $x = \sqrt{\frac{1}{7}} = .9701428$ the sine of double $52^{\circ} 1'$ the angle of projection; also the altitude is 34.765 , and the time $= 2.948''$.

Ingenuous answers were also given by Messrs. Barker, Bartlett, Bosworth, Cole, Dowden, Fatherley, Harris, Horticultura, Kelly, Lean, Leighton, Nicholson, Oliver, J. Phillips, R. Phillips, Reynolds, Richardson, Robinson, Rowe, Sharp, Terril, Todd, White, Willes, Williams, and Woolcott.

VI. Question 762 answered by Mr. Henry Clarke.

ANALYSIS. Let BCDE be a trapezium of which the sides are those given, and the $\angle CBE = \angle DEB$. Produce CD, BE till they meet in A, and through D, E, B describe a circle, and join D, G. Then, because the $\angle B = \angle E$, and the points B, G, D, E in the circumference of a circle, BG is $=$ ED, and $CG \parallel BE$; and therefore GC is given, as also DA from the similar triangles ABC, DGC. And because BC . CG is $=$ DC . CH, HC is given, and conseq. HA; but HA . AD is $=$ BE + EA . EA, from whence EA is given. Hence this Construction.—On the indefinite line AC take CD any one of the given sides of the trapezium, then take any two of the remaining sides as BC, ED, and make CG (BC — ED) : CD :: CB : CA, and CD : CB :: CG : CH, and find AE such that HA . AD $=$ BE + AE . AE. With the lines AE, DE, on the base AD constitute the $\triangle AED$, and on AE produced take EB $=$ the remaining side of the trapezium, and join B, C; and the thing is done. The demonstration is evident from the analysis.



Schol. It appears from the above construction that there may be different trapezia formed from the data, which will equally answer the conditions of the question.

Geometrical solutions were also given by Mr. Robert Hartley and Mr. N. Parnel. And algebraical solutions by Messrs. Barker, Cole, De Fletcher, Hawkes, Homicutur, Lean, Nicholson, Phillips, Reynolds, Sanderfon, Sharp, Terril, White, and Woolcott. Answers were also given by Messrs. Harris, Fatberley, Hodshon, Jackson, Littlewood, Oliver, Paritbmus, and Robinson.

VII. Question 763 answered by Mr. Mic. Taylor.

First, since $\sqrt{\frac{1}{1 - \frac{1}{2}x^2}} = 1 + \frac{x^2}{2 \cdot 2} + \frac{1 \cdot 3x^4}{2 \cdot 4 \cdot 2^2} + \frac{1 \cdot 3 \cdot 5x^6}{2 \cdot 4 \cdot 6 \cdot 2^3}$

Mult. by \dot{x} , then $\frac{\dot{x}}{\sqrt{1 - \frac{1}{2}x^2}} = \dot{A} = \dot{x} + \frac{x^2 \dot{x}}{2 \cdot 2} + \frac{1 \cdot 3x^4 \dot{x}}{2 \cdot 4 \cdot 2^2}$

And double the fluent is $2A = 2x + \frac{x^3}{3 \cdot 2} + \frac{1 \cdot 3x^5}{4 \cdot 5 \cdot 2^2} + \frac{1 \cdot 3 \cdot 5x^7}{4 \cdot 6 \cdot 7 \cdot 2^3}$

Mult. by $x\dot{x}$, so shall $\dot{B} = 2Ax\dot{x} = 2x^2\dot{x} + \frac{x^4\dot{x}}{3 \cdot 2} + \frac{1 \cdot 3x^6\dot{x}}{4 \cdot 5 \cdot 2^2}$

Take the fluents, so shall $B = \frac{2x^3}{3} + \frac{x^5}{3 \cdot 5 \cdot 2} + \frac{1 \cdot 3x^7}{4 \cdot 5 \cdot 7 \cdot 2^2}$ &c. which is the given series when $x = 1$.—Now to find A and B, since

$\dot{A} = \frac{\dot{x}}{\sqrt{1 - \frac{1}{2}x^2}}$, the fluent is $A = \sqrt{2} \times \text{arc, rad. } 1, \text{ fin. } \frac{x}{\sqrt{2}}$. The

$\dot{B} = 2Ax\dot{x}$, hence $B = Ax^2 - C$. Therefore

$\dot{C} = x^2 \dot{A} = \frac{x^2 \dot{x}}{\sqrt{1 - \frac{1}{2}x^2}}$, hence $C =$

$-x\sqrt{1 - \frac{1}{2}x^2} + \sqrt{2} \times \text{arc, fin. } \frac{1}{2}x = -x\sqrt{1 - \frac{1}{2}x^2} + A$

Therefore $B = Ax^2 - C = Ax^2 + x\sqrt{1 - \frac{1}{2}x^2} - A = x\sqrt{1 - \frac{1}{2}x^2} - A \cdot 1 - x^2$. That is $x\sqrt{1 - \frac{1}{2}x^2} - A \cdot 1 -$

$= \frac{2x^3}{3} + \frac{x^5}{3 \cdot 5 \cdot 2} + \frac{1 \cdot 3x^7}{4 \cdot 5 \cdot 7 \cdot 2^2}$ &c. in general. } And when $x =$ these become

$\sqrt{\frac{1}{2}} = \frac{2}{3} + \frac{1}{3 \cdot 5 \cdot 2} + \frac{1 \cdot 3}{4 \cdot 5 \cdot 7 \cdot 2^2} + \frac{1 \cdot 3 \cdot 5}{4 \cdot 6 \cdot 7 \cdot 9 \cdot 2^3}$ &c. the sum requir

The same answered by Mr. Henry Clarke.

THE sum of this series may be had from several theorems in my formation of series, but peculiarly belongs to No. 232. For multiply and (Σ) by 3, (reducing the latter expression) and the result is $\frac{3}{2 \cdot 4 \cdot 5 \cdot 7}$

$$+ \frac{3 \cdot 5}{2 \cdot 4 \cdot 6 \cdot 7 \cdot 9 \cdot 2^2} + \&c. = \frac{1}{6x} \times \text{fluent of } \frac{x^2}{1-x^2} = \frac{1}{4x^2}$$

$$\times \text{fluent } \frac{x^2}{1-x^2} - x^{\frac{1}{2}}x + \frac{1}{12x^2} \times \text{fluent } \frac{x^2}{1-x^2} - x^{\frac{3}{2}}x. \text{ The}$$

correct fluent of the first term is $\frac{1}{6x} \times \frac{2}{\sqrt{1-x}} = x - 2$, and the

fluents of the 2d and 3d terms are respectively $-\frac{1}{4x^2} \times$

$$\frac{2x^{\frac{1}{2}}}{\sqrt{1-x}} - \frac{2}{3}x^{\frac{3}{2}} - 2\mathcal{Q}, \text{ and } \frac{1}{12x^2} \times \frac{3x^{\frac{1}{2}} - x^{\frac{3}{2}}}{\sqrt{1-x}} - \frac{2}{5}x^{\frac{5}{2}} - 3\mathcal{Q},$$

(which need no correction) \mathcal{Q} being the circular arc, rad. 1, sin. \sqrt{x} . Now take $x = \frac{1}{2}$, and the expression becomes

$$\frac{1}{3} \times 2\sqrt{2} - \frac{2}{5} - \frac{\sqrt{2}}{2} \times \frac{2}{3\sqrt{2}} - 2\mathcal{Q} + \frac{\sqrt{2}}{3} \times \frac{7}{5\sqrt{2}} - \frac{1}{2} - 3\mathcal{Q},$$

which by reduction, and adding the first two terms of the proposed series ($\frac{2}{3}\mathcal{Q}$), produces $\frac{1}{2}\sqrt{2}$ for the required sum.

The same answered by Mr. Robert Phillips.

PUTTING $x =$ the circular arc to radius 1 and sine x , we have

$$2x + \frac{x^3}{3} + \frac{1 \cdot 3 \cdot x^5}{4 \cdot 5} + \frac{1 \cdot 3 \cdot 5 \cdot x^7}{4 \cdot 6 \cdot 7} \&c. = 2x; \text{ mult. by } x\dot{x}, \text{ and the}$$

$$\text{fluents give } \frac{2x^3}{3} + \frac{x^5}{3 \cdot 5} + \frac{1 \cdot 3 \cdot x^7}{4 \cdot 5 \cdot 7} \&c. = x^2x - \frac{1}{2}x + \frac{1}{2}x\sqrt{1-x^2};$$

where taking $x = \sqrt{\frac{1}{2}}$, and dividing by $\frac{1}{2}\sqrt{\frac{1}{2}}$, we have $\frac{2}{3} + \frac{1}{3 \cdot 5 \cdot 2} +$

$$\frac{1 \cdot 3}{4 \cdot 5 \cdot 7 \cdot 2^2} \&c. = \sqrt{2} \times c - \frac{1}{2}c \times 2 + \frac{1}{2} = \frac{1}{2}\sqrt{2} = \sqrt{\frac{1}{2}}, \text{ the sum}$$

of the series required.

Corollary. Hence in general, if x be taken $= \sqrt{\frac{1}{n}}$, and $c =$ the

arc, whose sine is $\sqrt{\frac{1}{n}}$, then shall $\frac{2}{3} + \frac{1}{3 \cdot 5^n} + \frac{1 \cdot 3}{4 \cdot 5 \cdot 7 \cdot n^2} +$

$$\frac{1 \cdot 3 \cdot 5}{4 \cdot 6 \cdot 7 \cdot 9 \cdot n^3} \&c. \text{ be } = \sqrt{n} \times c - \frac{1}{2}nc + \frac{1}{2}\sqrt{n-1}. \text{ And, in par-}$$

ticular, if $n = 1$, then $\frac{2}{3} + \frac{1}{3 \cdot 5} + \frac{1 \cdot 3}{4 \cdot 5 \cdot 7} + \frac{1 \cdot 3 \cdot 5}{4 \cdot 6 \cdot 7 \cdot 9} \&c. = \frac{1}{2}c =$

one-eighth of the circle whose radius is 1.

And in this last manner was the solution given by Mr. J. Nicolson, and Mr. Ja. Phillips.

VIII. Question 764 answered by Mr. Henry Clarke.

ANALYSIS. Imagine that the line BP is so drawn through the given point C, that the chords BO, LP, are in the given ratio. Then, by the property of the circle, we have $KC \cdot CI = PC \cdot CL$, hence the ratio of LC to LP is known. And again, $BC \cdot CO = AC \cdot CD$, from whence the ratio of BC to BO is also known; conseq. the ratios of BC, CL, LP, are given. Hence this *Construction*.—Take Cl, lp, to AC in the given ratio of CL, LP, to BC; then take the point i so, that $Cp : Cl :: Cl \cdot CK : Ci^2$, and apply $CL = Ci$, and through L and C draw the right line BP, and it is done.

Demonstration. For since $CL : CK :: Cl : CP$ per prop. of the circle, and $Cp : Cl :: Cl \cdot CK : CL^2 (Ci^2)$ per constr. we have $Cl : Cp :: CL : CP$, or *dividendo* $Cl : lp :: CL : LP$; and as the ratio of $CL : LP$ is above deduced from that of $BO : LP$, therefore BO, LP are in the given ratio, as required.

This problem was also constructed by Messrs. Cole, Fletcher, Lawson, Littlewood, Oliver, and Parnel. And algebraical solutions given by Messrs. Barker, Dees, Dowden, Fatherley, Harris, Horticultura; Lean, Nicholson, J. Phillips, Reynolds, Richardson, Robinson, Sanderson, Ter-rit, and White.

IX. Question 765 answered by Mr. Henry Clarke.

LET DI be any position of the indefinite line passing through the given point O, and FI a part of the curve described by the motion of the given point I as per question. Produce ID to d, and through the center B of the given circle draw AF, make $IG \perp OF$, and $BV \perp Dd$. Put $AB = a$, $OC = b$, $ID = d$, $OG = x$, and $GI = y$; then will $OI = \sqrt{x^2 + y^2}$, and $OD = d - \sqrt{x^2 + y^2}$; but per property of the circle $OD : OC :: OA : Od = \frac{2ab + b^2}{d - \sqrt{x^2 + y^2}}$, and since BV is \perp to Od , we have

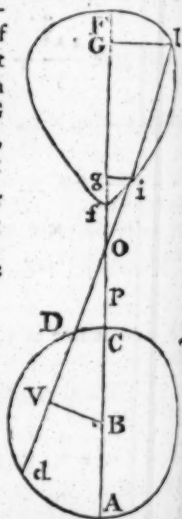
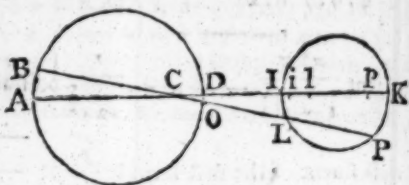
$$\frac{OD + Od}{2} = OV = \frac{ab + \frac{1}{2}b^2}{d - \sqrt{x^2 + y^2}} + \frac{1}{2}d - \frac{1}{2}\sqrt{x^2 + y^2}.$$

And, by sim. triangles, $OB : OV ::$

$$OI : OG = \frac{\sqrt{x^2 + y^2}}{2 \cdot a + b} \times \frac{2a + b \cdot b}{d \mp \sqrt{x^2 + y^2}} + d \mp \sqrt{x^2 + y^2} = x,$$

the equation of the curve.

If DI be less than AO, as Ap, the curve will have a *nodus* between O and p, the *punctum duplex* being at O; the affirmative sign taking place in the equation if the value of x be taken downwards from O towards p.



If the above expression be reduced, we shall have an equation of the 8th power for the locus of I, six of whose roots will be found impossible in the case of DI being greater than AO, and 4 when DI is less than AO. In the former case therefore a right line will cut the curve in 2 points only, and in the latter in four.

Ingenious solutions were also given by Messrs. Dymond, Fletcher, Hartley, Nicholson, Philarithmus, R. Phillips, Terril, White, and Woolcott.

X Question 766 answered by Amicus.

CONSTRUCTION. Thro' the given point E draw EX, EY, VS parallel to the given sides, let fall XV, YS, on which take $YZ : YS :: XV : VZ$, draw $ZH \parallel AB$, and draw HEG the line required.

Demonstration. Draw $GD \parallel AB$. Now when $GM + HN$ is a maximum, 'tis evident that $XD + YZ$ is a minimum; but by sim. triangles, $YS : XD :: YE : XG$; $YH : XE :: YZ : XV$, therefore the rectangle under XD, YZ being given $= YS \times XV$, the perimeter and consequently the sum of its sides will be a minimum when it is a square as per construction.

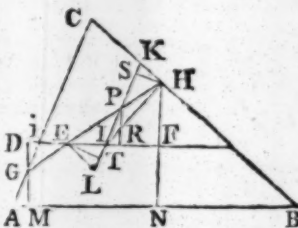
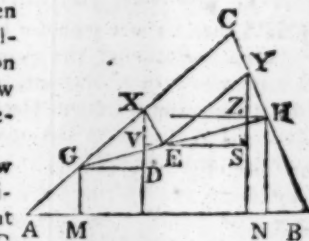
Corol. 1. If the sum of the perpendiculars be a given quantity, the sum of the sides of the given rectangle is given, and consequently the sides.

Corol. 2. Since XG is in a given ratio to XD , YH to YZ , and CX, CY given, the problem to draw a line through E, so that the sum of CG and a line to which CH has a certain given ratio, may be a minimum or given, is included in the above.

The same answered by Mr. Parnel.

ANALYSIS. Suppose that GH is drawn thro' the given point E as required; and draw $DEF \parallel AB$ cutting the \perp s MG and NH in D and F, and the side AC in i; and in DF take $Ei = Ei$, also draw $EL \parallel BC$, and $LIK \parallel AC$ cutting GH and BC in P and K; likewise draw ET and $HS \perp LK$, and $PR \perp DF$.

Then since $MG + NH = 2FN + FH$ AM N B
 PR (DG) is a maximum, $HF - PR$ must be so likewise, because FN is constant; and since the Δ s EHI and EPI have a common base EI , their areas are as their perpendiculars HF and PR , and \therefore the $\Delta ENI - EPI = PHI$ or $IP \times SH = PI \times ET \times PK \div PL$ (because $SH = ET \times PK \div PL$ by sim. Δ s) $= ET \times LP - LI \times LK - LP \div LP = ET \times LK + LI - ET \times LP^2 + LI \times LK \div LP$ is a max. But ET, LK , and LI being constant, $LP^2 + LI \times LK \div LP$ must evidently be a minimum; which may be considered as the hypotenuse of a right angled triangle, of which $LI \times LK =$ the square of the perpendicular let fall from the right angle, and LP one of the segments; which hypothe-



nuse must evidently be a minimum when the segments are equal; and then $LP^2 = LI \times LK$; hence this

Constr. Draw DF, EL, and LK as in the analysis, and take LP a mean proportional between LI and LK, then draw HPEG the line required.

Mr. Mof's solution, by the means of his problem solved in the last year's Diary, is very complete and ingenious, but too long for the limits of the Diary.

Other solutions were given by Messrs. Dees, Fatberley, Fletcher, Henderson, Hodshon, Horticultura, Jackson, Lean, Nicholson, Philarithmus, Phillips, Reynolds, Robinson, Sanderfon, Sharp, Terril and White.

XI. Question 767 answered by Mr. Robert Phillips.

THIS question was proposed last year with only one certain position of the quadrant, but this gentleman has given two solutions, one for each position. And first for the quadrant placed as in the annexed figure.—Put the radius CA or CB = 100 feet = a ,



the force of gravity $32\frac{1}{2}$ feet = s , the velocity of the point A = 125.66 feet per sec. = b , BE = x ; ED = y , the arc BD = z , the velocity of the ring D along the curve = v , and the time of describing BD = t . Then $b^2 a^{-1}$ = the centrifugal force of the point A, and $a : y :: b^2 a^{-1} : b^2 y a^{-2}$ = the centrifugal force of the ring at D in the direction ED, also $\dot{z} : \dot{y} :: b^2 y a^{-2} : b^2 y \dot{y} a^{-2} \dot{z}^{-1}$ = the effect of the centrifugal force to urge the ring down the curve BDA; but $\dot{z} : \dot{x} :: s : s \dot{x} \dot{z}^{-1}$ = the effect of gravity in the same direction; consequently $s \dot{x} \dot{z}^{-1} + b^2 y \dot{y} a^{-2} \dot{z}^{-1}$ is the whole force which accelerates the velocity of the ring down the curve, which by the principles of motion is = $v \dot{v} \dot{z}^{-1}$, therefore $v \dot{v} = s \dot{x} + b^2 a^{-2} y \dot{y}$,

and the fluents give $v^2 = 2sx + b^2 a^{-2} y^2 = 2sx + b^2 a^{-2} \cdot \frac{2ax - x^2}{2}$ by the property of the circle, and putting $2s + 2b^2 a^{-1} = m$, and $b^2 a^{-2} = n$, we have $v = \sqrt{mx - nx^2}$; hence the fluxion of the time $t = \frac{\dot{z}}{v} = \frac{a \dot{x}}{\sqrt{mx - nx^2} \times \sqrt{2ax - x^2}} = \frac{a \dot{x}}{x \sqrt{2am - m + 2an \cdot x + nx^2}}$

$$= \sqrt{\frac{a}{2m}} \times \frac{x^{-1} \dot{x}}{\sqrt{1 - cx + rx^2}}, \text{ where } r \text{ is } = \frac{n}{2am} \text{ and } c = \frac{m + 2an}{2am}$$

and the fluent of this expression is $t = - \sqrt{\frac{a}{2m}} \times \text{hyp. log. of}$

$$\frac{2 - cx + 2\sqrt{1 - cx + rx^2}}{x\sqrt{c^2 - 4r}}. \text{ But when } x = 0, \text{ this fluent and con-}$$

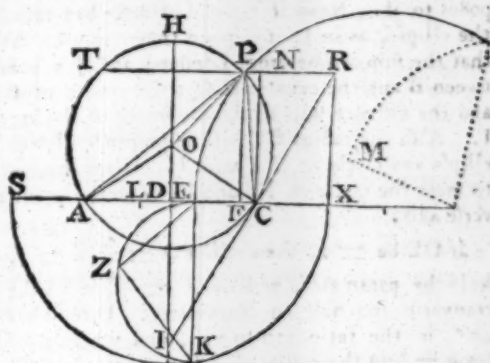
sequently the time t , is infinite, which shews that the ring must be put at some small distance from the upper end B, otherwise it will not descend; wherefore when $t = 0$, let $x =$ a very small quantity d , then the fluent

$$\text{corrected will be } t = \sqrt{\frac{a}{2m}} \times \text{h. l. } \frac{2x - cd + 2x\sqrt{1 - cd + rd^2}}{2d - cd + 2d\sqrt{1 - cx + rx^2}}$$

in which if d be taken = $\frac{1}{100000}$ part of a foot, the whole time when $x = 100$ feet = a , will come out 5.2258", the time of descent through nearly the whole quadrant.

This question was also answered by Messrs. Barker, Clarke, Fletcher, Horticultura, Terril, and Woolcott.

CONSTR. On the indefinite line AM take AE to EC in the given ratio of the sides of the triangle, and by the lemma p. 336 Simpson's Algebr. describe the semicircle EPM such, that any two lines AP, PC may obtain the given ratio of AE to EC. Make AL = EC, CX = CD = DA, and with radius DX describe the semicircle XKS, draw the



Demonstr. Describe a circle through the points A, C, P, and through the center O draw the indefinite line $HI \perp AM$; also draw $XR \parallel HI$, and $RT \parallel AM$; and through C draw RI . Now, EZK being a right-angle, $ZK^2 = EK^2 - EZ^2 = EX \cdot ES - DC^2 =$ because $LD = DE$ (per constr.) $EXL - DC^2$; and since $LM \cdot EF = ZK^2$ per constr. $EXL - DC^2 = LM \cdot EF = MEF + LEF$, but $MEF = EF^2 + EF \cdot FM =$ (per prop. of the circle) $EF^2 + (PF^2)RX^2$. Hence $EXL - DC^2 = EF^2 + RX^2 + LEF$, or $EXL - EF^2 - LEF = RX^2 + (DC^2)$

$CX^2 = CR^2$; but $EXL - EF^2 - LEF = \overline{LX} + EF \cdot \overline{EX} - EF =$
 TRP . Conseq. RC is a tangent to the circle TPC in the point C ; and
 $RC = CI$, because DC is $= CX$, and $RX \parallel DI$ per construction. And
therefore, by Simpson's Geom. cor. theor. 8 on the max. and min. the
rectangle DN , or the triangle APC is a maximum; and AP , PC are in
the given ratio by the construction.

It is hardly necessary to observe, that if a circle be described from the center O with the given radius, and the points of section of the periphery by the right lines OP, OC, OA (produced if necessary) be joined, we shall have the required triangle.

Solutions were also given by Messrs. Amicus, Barker, Dees, Deroder, Fatherly, Fletcher, Francis, Harris, Hodgeson, Horticultura, Jackson, Lear, Nicholson, Philanthropus, Reynolds, Richardson, Robinson, Rowe, Sanderson, Sharp, Terril, White, and Williams.

XIII. Question 769 answered by Nauticus.

LET EPQS be the elliptical meridian of London, EQ the equator, PS the earth's axis, P the north, and S the south pole. On EQ describe a circle, and take the arc EA = $51^{\circ} 23' 42''$, the tangent of which is to the tangent of the latitude of London ($51^{\circ} 31'$) as OP to OE: draw AD \parallel PO, cutting the ellipse in C, which will be the situation of London on the spheroid: draw the diameter CB, and B will be antipodes to it. Now if a circle be described from C as a center, to touch the ellipse, as in I, it is plain that I will be the farthest possible distance that the ship can be from London; and this point will manifestly be between B and the equator at Q: the course must therefore be due north, and the distance will be the difference of the latitudes of the points B and I. Also the radius CI will be perpendicular to a tangent drawn to the ellipse and circle at the point I. Draw the ordinate IR, which produce to meet the circle in T; and let G be the point where IC cuts the transverse axis.



If OE be = 1, then will $PO = \frac{229}{230} = e$, $e^2 = \frac{52441}{52900}$ will be half the parameter, and $1 - ee = \frac{459}{52900}$ the dif. between the semi-transverse and half the parameter. Diminish AD, the sine of $51^{\circ} 23' 42''$, in the ratio 230 to 229, and we gain CD, which put = a , and let $b = DO$ the cosine of $51^{\circ} 23' 42''$; also let $x = OR$ the cosine of the arc QT. Then, by the properties of the ellipse, $1 : ee :: 1 + x : 1 - x : cc$, $1 - xx = RI^2$; $1 : cc :: x : ccx = RG$; and $1 : 1 - cc :: x : x$, $1 - cc = GO$; hence $b + x \cdot 1 - cc = GD$; and, by sim. Δ s, $b + x \cdot 1 - cc : a :: ccx : c\sqrt{1 - xx}$; conseq. $ac^2x = b + x \cdot 1 - cc \times c\sqrt{1 - xx}$, or $\frac{b}{ac} = \frac{x}{\sqrt{1 - xx}} - x \cdot \frac{1 - cc}{ac}$. Here it is plain

that $\frac{x}{\sqrt{1 - xx}}$ is the cotangent of the arc TQ, its cosine being x ; from

which consideration we have the following easy and expeditious method of obtaining the value of x . Compute $\frac{b}{ac} = A$, and $\frac{1 - cc}{ac} = B$, and find the

logarithm of the latter. Now because the ellipse differs but little from a circle, the arc QT will be very little less than the arc EA: assume it $50^{\circ} 55'$; take out the nat. cotang. and the log. cosine; to the latter add the log. of B , find the number answering to the sum, and take it from the nat. cotang. of $50^{\circ} 55'$; if the remainder be = A , $50^{\circ} 55'$ is rightly assumed; but it will be found 0002869 too little. Assume the arc QT = $50^{\circ} 54'$; repeat the peration, and the result will be found 0001935 too great. Then $4804 (2869 + 1935) : 60 :: 1935 : 24''$; which being added to $50^{\circ} 54'$ gives $50^{\circ} 54' 24''$ for the arc QT. And as 229:

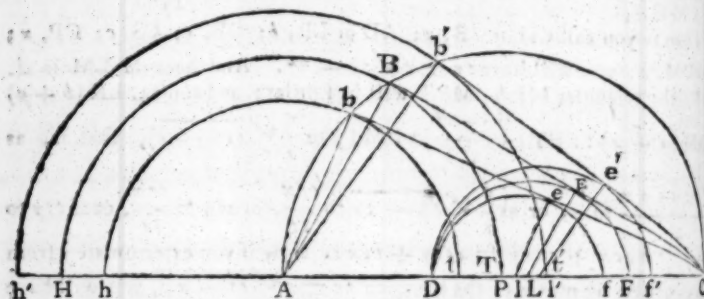
the equation for the ellipsis itself; but the equation of that tangent
 $tt - aa.y = tt - ax.b$; hence x and y may be found by simple equa-

tions, viz. $x = a + \frac{2at^2 - 2a^3.tt - cc}{tt.2cc - tt + 3a^2.tt - cc}$, and $y = b - \frac{2a^2b.tt - cc}{tt.2cc - tt + 3a^2.tt - cc}$ which give $x = 2522.4325$, and $y =$

3091.0941 ; and $\sqrt{x-a}^2 + b-y^2 \div CA$ or $\sqrt{a^2 + b^2} = \tan$
 of $29' 19''$ the dif. of lat. also $LM - LA = \sqrt{x+a^2 + y+b^2} -$
 $2\sqrt{a^2 + b^2} =$ the difference of distance sought very nearly.

Ingenious solutions were also given by Messrs. Barker, Cole, Francis, Hodgeson, Jackson, Nicholson, Phillips, Taylor, Todd, and Wollcott.

XIV. Question 770 answered by Rev. Mr. Wildbore.



CONSTRUCTION. From P, the center of the given semicircle take PH a mean proportional between RC and PC + 2DC, take AB = AH, join BC, to touch which through the given point D draw the semicircle DEF, and it will be that required.

Demonstration. Since by construction $PH^2 = PC^2$ or $HC.HA = 2CP.CD = CA.CD$, $\therefore CH:CA::CD:AH = AB$, but by sim. triangles, $CH:CA::CD:CL$ (L being the center of DEF), conseq. $AB = CL$; then BE is a max. and $BE^2 = CB^2 - CE^2 = 2CB.CD = CA^2 - AB^2 + CD.CF - 2CD.CT$ (because, by sim. triangles, $CE:CD::CT:CB = CA^2 - AB^2 + CD.2CL - CD - 2CD.CA - AB$ is a max. or, because CA and CD are given, $2CD.CL + AB - AB^2$ is a max. For suppose the contrary, and that Ab is less than AB, and conseq. Cl greater than CL when the intercepted part of the tangent is a max. then $2CD.Cl + Ab - Ab^2$ is greater than $2CD.Cl + AB - AB^2$, or, taking away $2CD.Ab - Ab^2$ from both, $2CD.Cl$ is greater than $2CD.CL + Hh - 2Ah.Hh - Hh^2$, $2CD.Ll$ than $2CD.Hh - 2Ah.Hh - Hh^2$, $2CD.CA$ than $Ch.2CD - 2Ah - Hh$ (because $Ll.CH.Ch = Hh.CA.CD$)

or than $CH \cdot Ch \cdot 2DL + Hh$ (because $2AH - Hh = 2Ah + Hh$, $AH = CL$, and $CD - CL = DL$), $2CD \cdot Cl \cdot Ch$ than $2DL \cdot CH$; $Ch + CH \cdot Hh \cdot Ch$ (because $Ch \cdot Cl = CA \cdot CD = CH \cdot CL$), $2CD \cdot Cl - CL$ than $CH \cdot Hh$ (because $DL \cdot CH = CD \cdot AH = CD \cdot CL$), $2CD^2 \cdot CA$ than $CH^2 \cdot Ch^2$, $2CH^2 \cdot CL^2$ than $CH^2 \cdot Ch \cdot CA$, or $2CL^2$ than $Ch \cdot CA$, $2CL \cdot Cl \cdot Ch$ than $CH \cdot Ch \cdot CA$ (because $CH \cdot CL = Ch \cdot Cl$), or $2CL \cdot Cl$ than $CH \cdot CA$, which is absurd, because $2CL = TH$ is less than CH , and Cl than CA . Theref. &c.

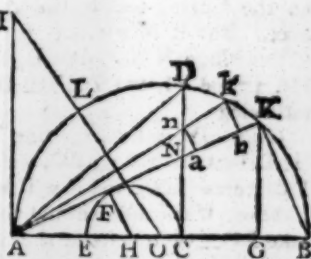
Again, if $Ab' = Ah'$ be greater than AB when $b'e'$ is a max. then, reasoning as before, $2CD \cdot Cl' + Ah' - Ah'^2$ is greater than $2CD \cdot$

$CL + AH - AH^2$, $2CD \cdot Cl' + Hh' - 2AH \cdot Hh' - Hh'^2$ than $2CD \cdot CL$, $2CD \cdot Hh' - 2AH \cdot Hh' - Hh'^2$ than $2CD \cdot Ll'$, $2CD \cdot CH \cdot Ch'$ than $2CD^2 \cdot CA + 2AH \cdot CH \cdot Ch' + CH \cdot Ch' \cdot Hh'$, $2CD \cdot CH$ than $2CD \cdot Cl' + 2AH \cdot CH + CH \cdot Hh'$, $2DL \cdot CH$ or $2CD \cdot AH$ or $2CD \cdot CL$ than $2CD \cdot Cl' + CH \cdot Hh'$, $2CD \cdot Ll'$ than $CH \cdot Hh'$, or $2CD \cdot CA$ than $CH^2 \cdot Ch'$, which is impossible, for it has been proved above*, not to be greater than $CH^2 \cdot Ch$. Theref. &c.

Scholium. This, according to Dr. Simson, is what the antients called a final determination, or one that followed the composition, and whose use was to distinguish at first sight from the data, whether the problem could be constructed at all, or not. Thus, if it be required to apply a line, verging to C, between the concavity of the semicircle ABC, and the convexity of DEF, $De'P$, or any other that passes through D, and that line be given greater than BE, it is manifest immediately that the problem cannot be constructed.

The same by Mr. Cullen O'Connor.

ANALYSIS. Suppose it done, and that ALDKB is the given semicircle, O its center, C the given point, CFE the required semicircle, AFK the required line, FK the maximum: Draw Ank indefinitely near ANK; also DnNC, $KG \perp AB$; and FH, na, kb, $KB \perp AK$. Now the tangents NF, NC are equal, $\therefore CN + NK (= FN + NK)$ is a max. and \therefore the increment of CN = the



decrement of NK; that is $Nn = Na + bK$; but the triangles Nna, bkK, ANC, AKG, AFH, KGB are all similar, $\therefore AN = NC + KG$, and (taking away $NC = NF$) $AF = KG$, $AH = KB$, $FH = BG$, and $AC = AH + HF = BK + BG$; but $AB : BK :: BK : BG$, and $AB : AB + BK :: BK : AC (BK + BG)$, or $AB \cdot AC = AD^2 =$

$AB + BK \cdot BK$. Hence comes this following

Constr. Make the tang. $Al = AD$, and draw ILO; then must BK be taken $= IL$; for $AD^2 = Al^2 = IL + 2LO \cdot IL = BK + BA \cdot BK$. Wherefore drawing AK and the \perp CN, take $NF = NC$, and draw $FH \perp FN$; then H is the center and HC the radius of the semicircle required.

Constructions were also given by Mr. H. Clarke and Mr. Wm. Cole. And other solutions by Messrs. Dees, Fletcher, Horticultura, Lean, Nicholson, Philarithmus, Reynolds, Terril, and White.

XV. Or Prize Question 771 answered by Nauticus.

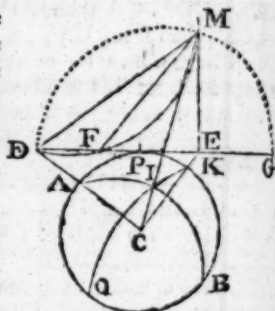
ANALYSIS. Let APBIQ be a sphere to be projected by an eye at the center C, on a plane touching it in P, the pole of projection; and let A be the given point where the angle is to be formed by the great circle APBQ, which passes thro' the said pole, and the great circle AIB; moreover let KIQ be a great circle, the plane of which is at right angles both to the plane of the circle AKBQ and to that of the circle AIB; then will the arch KI be the measure of the spherical $\angle KAI$. Draw CK, CA, and CI, which meet the plane of projection in E, D, and M; draw also EM and DM; which, because all great circles are represented by right lines in this projection, will be the representations of the circles KIQ and AIB, and conseq. the former of them will be the line of measures to the latter, and be \perp to DE, which is the representation of the circle APBQ. Hence therefore the $\angle EDM$ is the angle made by the representations of the circles APBQ and AIB on the plane of projection. It is also farther manifest that the plane angle ECM, being measured by the arch KI, is $=$ the spherical $\angle KAI$, which is measured by the same arch. Take $EF = EC$, and draw FM. Then the \angle s FEM, CEM being both right, $FE = CE$, and EM common, the $\angle EFM$ is $= \angle ECM$, that is, $=$ the spherical $\angle KAI$, formed by the circles on the sphere: conseq. the $\angle DMF = \angle EFM - \angle EDM$ must be a max. But it is manifest that when the $\angle DMF$ is a max. a circle described through the points D, F, M, will touch EM; and conseq. (Eucl. III, 37 and VI, 17) $EM^2 = DE \cdot EF = DE \cdot EC$; and hence comes the following

Constr. Draw CA, meeting DE the plane of projection in D, and CKE \perp CD; take $ED = EC$, describe the semicircle DMG, erect $EM \perp$ DG; draw MD, and it will be the representation required.

Schol. If the difference of the angles be required equal to a given angle take $EF = EC$, describe the circle DFM to contain that angle, and draw the representation from D to the point where the circle cuts EM. But if, in this case, the circle neither cut nor touch EM, the problem is impossible.

Nearly in the same manner was the solution given by Messrs. Amicus, Bosworth, Clarke, Cole, Edwards, King, Nicholson, Phillips, Plus Minus, J. and S. Roberts, Serwell, Taylor, Walton, Williamson, and Wolfenden.

ERRATUM in last year's Diary, p. 35, l. ult. for otherwise no read is always an.



NEW QUESTIONS.

I. QUESTION 772 by Mr. John Penberthy.

FOR Susan tho' long I have sigh'd, her coldness still causes me smart,
Yet every effort's been try'd, to warm with affection her heart.
But my wooings, alas! is in vain, and my doom irrevocable stands,
Unless you the mystery explain, what 'tis that my fair one demands.

$$\left. \begin{aligned} v^2 + vx + vy + vx &= 252 \\ x^2 + xv + xy + xz &= 504 \\ y^2 + yv + yx + yz &= 396 \\ z^2 + zv + zx + zy &= 144 \end{aligned} \right\} \text{where } v, x, y, z \text{ denote the letters in} \\ \text{the alphabet composing the word.}$$

II. QUESTION 773 by Philaethes.

A Gentleman has a right-angled triangular garden whose hypotenuse is 100 yards, and in one of the sides of it stands a tree at the distance of 20 yards from the right angle; moreover, standing at the opposite angle, I observed the tree appeared to stand in the middle of the side. Hence I would know the area of the garden.

III. QUESTION 774 by Mr. Mark Elstob, of Shotton, Durham.

IN surveying a circular field, which resembled the surface of a cone, I took a station on the top of the hill in the very middle of it, and found the greatest sum of the angles formed at that point, quite around, to amount to 342 degrees. I also took the angle of depression of an object, which I knew to be 6 chains distant on a level from the hedge, in an adjacent inclosure, equal to 13 deg. 1 min. Required the area of the field.

N. B. Mr. Elstob intends to publish a treatise on surveying, price four shillings, when he shall have received 500 subscriptions.

IV. QUESTION 775 by Mr. Joel Lean.

STANDING at an unknown distance from an octagonal house, in the line perpendicular to one of its sides, I observed the angle subtended by the extreme visible corners; then advancing 100 feet nearer in the same line, I found the same angle to be triple of what it was at the first station; and advancing 20 feet still nearer, found I was in a line with two of the sides. Required the area of the floor within; the walls being two feet thick.

V. QUESTION 776 by Mr. John Turner.

IF through the focus of a conic hyperbola any right line be drawn, terminated by the curve on both sides; the rectangle of the two parts intercepted by the focus and the curve, applied to the whole line, will be a constant quantity. Required the demonstration.

N. B. Mr. Turner informs us, that he has lately completed his Mathematical Exercises, by publishing the 6th No. of that work, price 1s. at Rivington's, where the former five numbers are also to be had.

VI. QUESTION 777 by the Rev. Mr. Crakelt.

TWO circles being given both in position and magnitude, it is required to find a point in the circumference of one of them, from whence if a tangent be drawn to cut that of the other, the part of it intercepted between the two circumferences may be equal to a given line, and to determine the limits of possibility.

VII. QUESTION 778 by Mr. Wm. Cole.

IF from the acute angle at the base of a given right-angled triangle, a right line be drawn to intersect the perpendicular, produced ad libitum; and if the said line be supposed to revolve about the angular point from which it is drawn; it is required to find the nature of the curve described by a point in that line whose distance from the intersection is, always, equal to the distance of the intersection from the vertex of the given triangle.

VIII. QUESTION 779 by Mr. Nathan Parnel.

GIVEN the magnitude and position of two circles, to draw a right line parallel to a right line given in position, to cut both circles, so that the chords of the segments cut off shall be in a given ratio.

IX. QUESTION 780 by Nauticus.

TWO ships sail at the same time from a port in a lode 48 deg. 16 min. north, and arrive at the same time also at two others lying in the same parallel of latitude; one sails at the rate of 7, and the other at the rate of 9 knots; and the angle included by their two tracks is bisected by the N. N. E. rumble; it is also known that the sum

of the distances run by the two ships, and the distance between the two ports, is 600 miles. Required the distance between the ports, the latitude they are in, and the course and distance run by each ship.

X. QUESTION 781 by Mr. Geo. Sanderson.

TO produce the diameter BD of a given circle to E, so that, drawing the tangent EF, and from the point of contact F letting fall the perpendicular FG on the diameter BD, it may divide the line AE in a given ratio at G; A being a given point on the diameter BD.

XI. QUESTION 782 by Mr. Henry Clarke.

IT is required to exhibit (without circular arcs or logarithms) a finite value of the expression

$$\frac{1}{2}x^{-\frac{5}{2}}f \dot{x} \times \frac{2}{3}f \dot{x}^{-\frac{2}{3}} \dot{x} \times \frac{3}{4}f \sqrt{1-x}^{-\frac{1}{2}} \dot{x} + \sqrt{1-x}^{-\frac{3}{2}} x \dot{x} - \dots$$

when x (which is supposed to begin from 0) is ultimately expounded by $\frac{1}{2}$; f denoting the fluent of the whole quantity under its respective vinculum.

XII. QUESTION 783 by Mr. Thomas Mofs.

THROUGH a given point A, is to draw an indefinite right line PQ, to which lines BD, CF be drawn from two other given points B, C, and forming given angles with the said indefinite line PQ, the rectangle contained under the parts AD, AF, intercepted by the given point A and the two lines to drawn, shall be equal to the square of a given line MN.

XIII. QUESTION 784 by Terricola.

IF a ball be let fall from the surface, down a perforation made diametrically through the earth; it is required to find its velocity and time of falling to the center, to any given point, with the other circumstances of its motion; abstracted from the effect of the earth's rotation; and on the supposition that the earth is a homogeneous sphere of 8000 miles diameter.

XIV. QUESTION 785 by Amicus.

GIVEN the perimeter, and the two differences of the sides and segments of the base in one sum. to construct the triangle a maximum.

XV. QUESTION 786 by Plus Minus.

IT is required to find the length of a pendulum whose vibrations are isochronous with those of a given cylinder, when a given point in its axis is made the point of suspension; and also what point in its axis is the point of suspension when the time of vibration is the shortest.

XVI. Or PRIZE QUESTION 787 by Peter Puzzlem.

TO find the force and its direction requisite (at every instant) to cause a projectile to describe such a trajectory, that the body shall always be found in the arc of a given conic parabola, revolving with an invariable angular velocity about its axis, the direction of the required force being always in a plane passing through the focus at right angles to the plane of the revolving parabola.

A Geometrical Paradox by C. Bumpkin.

ON the curve surface of a solid, generated by the revolution of any conic hyperbola about a certain axis situated in the plane of the hyperbola, any number of right lines of any length may be drawn! Query, How?

*** The prizes have been determined by lot as follows. First, for the solution of the prize question, to Mr. Rob. Phillips 12, and to Mr. Wm. Walton 8 diaries; 2dly, for the solution of the prize enigma, to Mr. Isaac Gamley 10, and to Mr. Betty Smales 8 diaries.---3dly, for the general solution of the enigmas, to Mr. Blanch Lean 10, and to Mr. Tho. Woolton 10 diaries.---4thly, for the solution of the queries, &c. to Mr. Francis Smith 8, and to Mr. Rob. Dowden 8 diaries. All of whom will please to order them to be called for at Stationers-hall, London. Letters for the use of the Diary must be directed thus, "For the Ladies' Diary Stationers-hall, London."

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